

# **Exhibit 6**

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UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF MICHIGAN

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JASON COUNTS, DONALD KLEIN, C.A. NO.  
OSCAR ZANORA, DEREK LONG, 1:16-CV-12541-TLL-PTM  
HASSAM HIRMIZ, JASON SILVEUS,  
JOHN MISKELLY, THOMAS HAYDUK,  
CHRISTOPHER HEMBERGER and  
JOSHUA RODRIGUEZ, individually  
and on behalf of all others similarly  
situated,

Plaintiffs,

-against-

GENERAL MOTORS LLC, ROBERT  
BOSCH GMBH, and ROBERT  
BOSCH, LLC, et al.,  
Defendants.

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VIRTUAL VIDEOTAPED DEPOSITION OF RYAN HARRINGTON  
NATICK, MASSACHUSETTS  
Wednesday, July 22, 2020


VOLUME 1

REPORTED BY:  
ROBIN CLARK, RPR, CLR

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<p style="text-align: right;">Page 2</p> <p>1 Virtual Videotaped Deposition of RYAN  2 HARRINGTON, taken by Plaintiffs, pursuant to notice,  3 commencing at 10:12 a m., by and before Robin L.  4 Clark, Registered Professional Reporter and Notary  5 Public in and for the Commonwealth of Pennsylvania.  6 -----  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25</p>	<p style="text-align: right;">Page 4</p> <p>1 REMOTE APPEARANCES, continued:  2  3  4 CLEARY GOTTLIEB STEEN &amp; HAMILTON, LLP  5 BY: PATRICK SWIBER, ESQ  6 DAVID BRODSKY, ESQ  7 RENEE GRIFFIN, ESQ  8 2000 Pennsylvania Avenue, N W  9 Washington, D C 20006  10 202-947-1588  11 pswiber@cgsh.com  12 dbrodsky@cgsh.com  13 rgriffin@cgsh.com  14 For the Defendant Robert Bosch  15 LLC  16  17 ALSO PRESENT REMOTELY:  18  19 STEVEN HURVITZ, ESQ  20  21 JOELLE ROSEN  22  23 HOWARD BRODSKY, VIDEOGRAPHER  24  25 JUSTON SMITHERS  26  27 -----  28  29  30  31  32  33  34  35</p>
<p style="text-align: right;">Page 3</p> <p>1 REMOTE APPEARANCES:  2  3 HAGENS BERMAN SOBOL SHAPIRO, LLP  4 BY: GARTH WOJTANOWICZ, ESQ  5 STEVE BERMAN, ESQ  6 1301 Second Avenue, Suite 2000  7 Seattle, Washington 98101  8 206-623-7292  9 garthw@hbsslaw.com  10 steve@hbsslaw.com  11 For the Plaintiffs  12  13 CARELLA, BYRNE, CECCHI, OLSTEIN, BRODY &amp;  14 AGNELLO, P C  15 BY: JAMES E CECCHI, ESQ  16 ZACH BOWER, ESQ  17 5 Becker Farm Road  18 Roseland, New Jersey 07068  19 973-997-1700  20 jcecchi@carellabyrne.com  21 zbower@carellabyrne.com  22 For the Plaintiffs  23  24 SEEGER WEISS, LLP  25 BY: SHAUNA ITRL, ESQ  26 1515 Market Street, Suite 1380  27 Philadelphia, Pennsylvania 19102  28 215-564-2300  29 sitri@seegerweiss.com  30 For the Plaintiffs  31  32 KIRKLAND &amp; ELLIS, LLP  33 BY: RENEE D SMITH, ESQ  34 JEFFREY S BRAMSON, ESQ  35 300 North LaSalle  36 Chicago, Illinois 60654  37 312-862-2000  38 rdsmith@kirkland.com  39 jeffrey.bramson@kirkland.com  40 For the Defendant General  41 Motors LLC  42  43  44  45</p>	<p style="text-align: right;">Page 5</p> <p>1 I N D E X  2 WITNESS PAGE  3 RYAN HARRINGTON  4 BY MR. WOJTANOWICZ: 11  5  6 E X H I B I T S  7 NUMBER DESCRIPTION MARKED  8 Harrington  9 Exhibit 1 Expert Report of Ryan 17  10 Harrington  11  12 Exhibit 2 Chevrolet Cruze Diesel 268  13 Discussion with EPA &amp; CARB  14 9/13/16 Document Bates  15 GMCOUNTS0000851587 TO 51607  16 Exhibit 3 Application for 287  17 Certification 2015 Model  18 Year Document Bates  19 GMCOUNTS000812193 to  20 GMCOUNTS000812238  21 Exhibit 4 Certification Summary 287  22 Information Report Bates  23 GMCOUNTS000222607 to  24 000222624  25  26  27  28  29  30  31  32  33  34  35</p>

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<p style="text-align: right;">Page 22</p> <p>1 vehicle control theory and he supported me in  2 many, many cases related to diesel engine,  3 diesel engine control and emissions.  4 Q. What about David Anderson, what was  5 his role in assisting you?  6 A. So David is a Ph.D mechanical  7 engineer with a lot of experience in diesel  8 after treatment systems, so, you know, he kind  9 of brought in some general support and then  10 also assisted in the analysis of some of Mr.  11 Smithers' data, the PEMS reports and then the    15 role?  16 A. So she was the project manager on  17 the project. She helped kind of, me kind of  18 make sure that everything was getting done and,  19 you know, kind of on a timely basis and then  20 provided some input on testing and other  21 aspects.  22 Q. And then Peter, I can't read my own  23 handwriting, Peter, is it Lillo?  24 A. Lillo, yes.  25 Q. What was his role?</p>	<p style="text-align: right;">Page 24</p> <p>1 in your work in this case?  2 A. He helped with some of the analyses  3 of, you know, kind of the PEMS setup and PEMS  4 protocols in the regulatory environment kind of  5 best practices related to PEMS testing.  6 Q. And what is Mr. Wishart's  7 credential or specialty, do you know?  8 A. So I think his -- he has got a  9 Ph.D. It's in engineering mechanics or  10 mechanical engineering. He's worked with PEMS  11 equipment in his prior work, fuel efficiency,  12 plug-in hybrid vehicles. I'm trying to think,  13 most of his work was kind of in the electric  14 vehicle plug-in hybrid emissions realm with  15 vehicles from an inspection and testing  16 capability.  17 Q. And Matthew Pooley, what was his  18 role?  19 A. So he helped, he's a Ph.D in  20 electrical engineering and computer science.  21 So he assisted myself and David Anderson  22 looking through the control strategy and Mr.  23 Levchenko's report.  24 Q. And what about Sri Danthurthi?  25 A. Danthurthi, so she helped with</p>
<p style="text-align: right;">Page 23</p> <p>1 A. So he was the Ph.D mechanical  2 engineer that performed the vehicle inspection.  3 Q. And did he do anything else  4 significant in connection with your work in  5 this case?  6 A. Most of it had to do with the  7 vehicle inspection and looking at the ECM data  8 and helped, you know, kind of analyze the  9 findings from the inspection.  10 Q. And that inspection you're  11 referring to, is that the inspection that  12 Defendants conducted of the diesel Cruze and  13 the gas Cruze vehicle that were used in the  14 testing that Mr. Smithers reported on?  15 A. That is correct.  16 Q. And Jeffrey Willard [sic], what was  17 his role?  18 A. Jeffrey Wishart.  19 Q. I'm sorry, Wishart.  20 A. So he was also at the inspection  21 looking at the PEMS equipment. I believe he  22 did the drive of the vehicle and most of his  23 focus was on the PEMS equipment and testing.  24 Q. Did he have any role beyond the  25 vehicle inspection that you were talking about</p>	<p style="text-align: right;">Page 25</p> <p>1 quality checking the report, so just verifying  2 some of the calculations and the numbers and  3 making sure the footnotes and everything lined  4 up.  5 Q. Are all the people that you have  6 identified, been able to identify as people  7 assisting you in preparing the report, are they  8 all employees of Exponent?  9 A. Yes.  10 Q. Did you retain any outside  11 consultants in order to help you with the work  12 that you did in this case?  13 A. I didn't retain any outside  14 support. The Analysis Group supports Kirkland  15 and Ellis and the client and I had some  16 interactions with their staff.  17 Q. And who did you interact with on  18 their staff?  19 A. Andrea Okie, Kris Comeaux, and  20 Kerri Leonhardt.  21 Q. And for what purpose were you  22 dealing with them? Why were you talking to  23 them?  24 MS. SMITH: I'm just going  25 to -- I'm so sorry, I'm just going to</p>

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<p style="text-align: right;">Page 26</p> <p>1 object and you can say if they provided 2 facts or data or did actual work in 3 connection with your report, but other 4 than that, I would just caution to not 5 respond regarding communications you 6 may have had with them, which I don't 7 think is what Garth is asking, but I 8 just want to be careful. 9 MR. WOJTANOWICZ: Hold on, 10 Renee, I would like to ask for a 11 clarification. Are you indicating that 12 you believe that discussions between 13 Mr. Harrington and the Analysis Group 14 are subject to attorney-client 15 privilege or work product? 16 MS. SMITH: I believe it is 17 subject to at least the work product 18 privilege and as Mr. Shaeffer said in 19 an email, that the communications 20 between people who he may be working 21 with may be privileged. He can talk 22 about just pursuant to Rule 26, he can, 23 obviously, say if facts or data was 24 provided to him, but the actual 25 communications he's having with them,</p>	<p style="text-align: right;">Page 28</p> <p>1 THE WITNESS: Okay. So the 2 Analysis Group did look at some of Mr. 3 Smithers' data and did some data 4 analyses on that looking at routes and 5 things like that and how to kind of put 6 together the data that Mr. Smithers 7 provided. So they provided some of 8 that to which my staff at Exponent 9 reviewed and we basically redid all of 10 it and then did kind of a QC to make 11 sure that we were correctly 12 interpreting -- 13 THE STENOGRAPHER: And did 14 kind of what, wait a minute, there was 15 a glitch, you did kind of what? 16 THE WITNESS: So we checked 17 the data and used -- and made sure that 18 our analyses and compiling of Mr. 19 Smithers' data was consistent with the 20 Analysis Group just to double check 21 that we were all looking at the data 22 correctly and understood it correctly. 23 BY MR. WOJTANOWICZ: 24 Q. Was the additional analysis 25 performed by the Analysis Group done according</p>
<p style="text-align: right;">Page 27</p> <p>1 yes, I will say are privileged and 2 protected -- 3 BY MR. WOJTANOWICZ: 4 Q. Well, let me rephrase my question. 5 Were you communicating with the Analysis Group 6 in order to obtain facts or data that you were 7 using in connection with the analysis performed 8 for your report? 9 A. I'm sorry, I think I lost track of 10 everything. Could you restate the question? 11 Q. Sure. Were you communicating with 12 the Analysis Group in order to obtain facts or 13 data for purposes of performing the analysis 14 described in your report? 15 MS. SMITH: Garth, let me 16 clarify the objection and instructions 17 so we're on the same page, is he can 18 disclose if Analysis Group provided 19 facts or data, the substance of the 20 communications, what they were about, I 21 would instruct not to answer. But he 22 can certainly provide information if 23 they provided facts or data that he 24 relied upon in forming his opinions in 25 this case or considered.</p>	<p style="text-align: right;">Page 29</p> <p>1 to your instruction or specification? 2 A. Yes, so I had worked with them and 3 my staff had worked with them to instruct them 4 on what we were looking to do and, you know, 5 provided guidance as to what type of analysis 6 we were planning to do. 7 Q. And what type of data or analysis 8 did they provide you with? 9 A. So, again, as I mentioned, it was 10 the data that Mr. Smithers had provided, so his 11 routes and his segments, some of the Excel 12 files and the presentation materials that he 13 provided, you couldn't always glean all the 14 information out, so it was looking to compile 15 all of that so that we could, you know, kind of 16 double check his analyses and then understand 17 how they were put together so that we could 18 then analyze them ourselves. 19 Q. So you're referring to data that 20 Mr. Smithers provided, but presumably, Analysis 21 Group did something with that data rather than 22 just giving you what Mr. Smithers already 23 produced, so what was the product, the work 24 product that they gave you? 25 MS. SMITH: Sorry, again, I</p>



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<p style="text-align: right;">Page 34</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. And describe the documents for me,</p> <p>3 would you please?</p> <p>4 A. They would have been light-duty or</p> <p>5 heavy-duty regulations from the code of federal</p> <p>6 regulations, so documents that are online that</p> <p>7 the EPA and CARB would have been putting out.</p> <p>8 Q. Did the Analysis Group provide any</p> <p>9 summary or analysis relating to those</p> <p>10 regulations that they provided to you?</p> <p>11 A. There wasn't a separate analyses.</p> <p>12 I think from time to time, they provided on the</p> <p>13 report, provided some input on some of those</p> <p>14 things that I had asked them to do and provided</p> <p>15 some edits --</p> <p>16 MS. SMITH: Yeah, I'm just</p> <p>17 going -- I'm sorry to interrupt, I just</p> <p>18 want to caution you that in terms of</p> <p>19 any of the substance of draft reports,</p> <p>20 things like that, I would just caution,</p> <p>21 it's fine, he can answer the question</p> <p>22 that Garth just asked, but I just want</p> <p>23 to caution that the draft reports are</p> <p>24 and communications related thereto, we</p> <p>25 would maintain the privilege on.</p>	<p style="text-align: right;">Page 36</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Did the Analysis Group draft any</p> <p>3 sections of your report?</p> <p>4 A. I had set forth the outline of the</p> <p>5 report and kind of the structure of it and then</p> <p>6 at my direction, my staff helped me draft some</p> <p>7 of it. I think the Analysis Group did assist</p> <p>8 in drafting a few parts of it or kind of</p> <p>9 augmenting some of what we had and then my</p> <p>10 staff or myself reviewed all of that.</p> <p>11 Q. What sections of the report did the</p> <p>12 Analysis Group help to draft?</p> <p>13 A. I mean, I can't remember the exact</p> <p>14 specifics, but I think in the appendices,</p> <p>15 there's some discussion of the regulatory</p> <p>16 requirements and testing. So if there was some</p> <p>17 input from the Analysis Group, it would have</p> <p>18 been mostly in those sections.</p> <p>19 Q. Aside from information in the</p> <p>20 appendices relating to regulatory requirements</p> <p>21 are there any other sections of the report that</p> <p>22 you can recall the Analysis Group helping to</p> <p>23 draft?</p> <p>24 A. I don't remember them helping draft</p> <p>25 any of those sections. They might have</p>
<p style="text-align: right;">Page 35</p> <p>1 MR. WOJTANOWICZ: It didn't</p> <p>2 sound like you were done with your</p> <p>3 answer there. Do you want to continue?</p> <p>4 THE WITNESS: Could you ask</p> <p>5 the question again? I can't remember</p> <p>6 what the question was.</p> <p>7 MS. SMITH: I'm sorry, I</p> <p>8 apologize for interrupting.</p> <p>9 BY MR. WOJTANOWICZ:</p> <p>10 Q. I was asking whether the Analysis</p> <p>11 Group provided any analysis or commentary</p> <p>12 relating to the regulatory documents that they</p> <p>13 sent to you?</p> <p>14 MS. SMITH: Okay. I'm going</p> <p>15 to instruct not to answer. To the</p> <p>16 extent there is commentary, he can</p> <p>17 disclose if Analysis Group provided or</p> <p>18 did work or facts or data upon which</p> <p>19 Mr. Harrington relied.</p> <p>20 THE WITNESS: So, again,</p> <p>21 they provided some input into the</p> <p>22 report, but I don't remember separate</p> <p>23 analyses that they had done or</p> <p>24 communicated.</p> <p>25</p>	<p style="text-align: right;">Page 37</p> <p>1 provided some input on, you know, how -- if</p> <p>2 some sections didn't read very well and</p> <p>3 provided some thoughts there, but --</p> <p>4 MS. SMITH: Yeah, I'm going</p> <p>5 to instruct not to answer and just to</p> <p>6 be careful, like, in terms of</p> <p>7 commentary you're asking, in terms of</p> <p>8 wording, you can answer, if Analysis</p> <p>9 Group did -- actually provided</p> <p>10 analysis, data, facts upon which you're</p> <p>11 relying.</p> <p>12 BY MR. WOJTANOWICZ:</p> <p>13 Q. For the sections that the Analysis</p> <p>14 Group helped to draft, did you rely upon their</p> <p>15 expertise in these areas in order to determine</p> <p>16 whether that information should be included in</p> <p>17 your report?</p> <p>18 MS. SMITH: One more second.</p> <p>19 Hold on.</p> <p>20 THE WITNESS: I took their</p> <p>21 information --</p> <p>22 MS. SMITH: Hold on, one</p> <p>23 second, sorry. Okay. You may answer.</p> <p>24 Sorry, I just wanted to check.</p> <p>25 THE WITNESS: So, again, as</p>

10 (Pages 34 - 37)



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<p style="text-align: right;">Page 38</p> <p>1 I stated, I reviewed the information or</p> <p>2 my staff reviewed the information that</p> <p>3 was provided, but Exponent used our</p> <p>4 expertise and my expertise to form, you</p> <p>5 know, the opinions based on that</p> <p>6 information.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. So you formed your opinions using</p> <p>9 your own expertise, but in doing so, you</p> <p>10 considered this information provided to you</p> <p>11 from the Analysis Group, correct?</p> <p>12 MS. SMITH: Objection, form.</p> <p>13 THE WITNESS: So some of the</p> <p>14 analyses or documents they provided, I</p> <p>15 considered, but my opinions and my</p> <p>16 analyses were done by myself or my</p> <p>17 staff.</p> <p>18 MR. WOJTANOWICZ: Okay.</p> <p>19 Renee, I would ask that General Motors</p> <p>20 produce the documents between the</p> <p>21 Analysis Group and Mr. Harrington as</p> <p>22 part of the materials that he</p> <p>23 considered in connection with forming</p> <p>24 his opinions in this case.</p> <p>25 MS. SMITH: Yeah, I believe</p>	<p style="text-align: right;">Page 40</p> <p>1 that we knew the documents were coming.</p> <p>2 There might have been a clarifying</p> <p>3 statement here or there, but most of it</p> <p>4 was in the report.</p> <p>5 BY MR. WOJTANOWICZ:</p> <p>6 Q. And what did you do to -- you said</p> <p>7 that you relied on your own expertise or the</p> <p>8 expertise of people within Exponent to -- with</p> <p>9 respect to the parts of the report that were</p> <p>10 drafted by the Analysis Group. What did you do</p> <p>11 in order to verify those sections using your</p> <p>12 own expertise?</p> <p>13 MS. SMITH: Objection, form.</p> <p>14 THE WITNESS: So as is</p> <p>15 typical even with stuff that's drafted</p> <p>16 by Exponent, we always have another</p> <p>17 individual read over of the documents,</p> <p>18 read over of the report, check all the</p> <p>19 references, check all the calculations,</p> <p>20 so and any part of the report, my staff</p> <p>21 and then myself is another QC who goes</p> <p>22 through the report, reads it all, looks</p> <p>23 at the analyses, double checks the work</p> <p>24 for accuracy.</p> <p>25</p>
<p style="text-align: right;">Page 39</p> <p>1 all facts and data which he considered</p> <p>2 were produced, but we will double</p> <p>3 check.</p> <p>4 BY MR. WOJTANOWICZ:</p> <p>5 Q. Did you have email communications</p> <p>6 with the Analysis Group regarding the -- we're</p> <p>7 not asking for the content of those</p> <p>8 communications at this point, did you have</p> <p>9 email communications or phone communications</p> <p>10 with the Analysis Group regarding the sections</p> <p>11 of the report that they drafted?</p> <p>12 A. Can you ask the question again?</p> <p>13 Q. Sure. Did you have telephone or</p> <p>14 email communications with the Analysis Group</p> <p>15 regarding the sections of the report that they</p> <p>16 drafted?</p> <p>17 A. I believe there was some</p> <p>18 communication with them.</p> <p>19 Q. And was the purpose of that</p> <p>20 communication to consider their -- the basis</p> <p>21 for the statements that they made that you were</p> <p>22 considering putting inside your report?</p> <p>23 MS. SMITH: Objection, form.</p> <p>24 THE WITNESS: So it was more</p> <p>25 of a coordination role to make sure</p>	<p style="text-align: right;">Page 41</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Have you spoken -- you're aware</p> <p>3 that there are other experts who have submitted</p> <p>4 reports in this case on behalf of Defendants</p> <p>5 Bosch and GM?</p> <p>6 A. That's my understanding.</p> <p>7 Q. Have you reviewed any other expert</p> <p>8 reports submitted on behalf of Defendants?</p> <p>9 A. No, I have not.</p> <p>10 Q. Do you know who Nick Molden is?</p> <p>11 A. I'm aware of who he is, but I don't</p> <p>12 know him. I haven't seen anything from him.</p> <p>13 Q. So you've not reviewed the report</p> <p>14 that he submitted in this case?</p> <p>15 A. I have not.</p> <p>16 Q. And have you spoken with</p> <p>17 Mr. Molden?</p> <p>18 A. I have not.</p> <p>19 Q. Have you, and when I say "you,"</p> <p>20 has -- do you know whether any of the staff</p> <p>21 working under your direction for purposes of</p> <p>22 preparing this report have reviewed Mr.</p> <p>23 Molden's report?</p> <p>24 A. No, they have not.</p> <p>25 Q. Has anyone working under your</p>



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<p style="text-align: right;">Page 54</p> <p>1 THE WITNESS: Not that I can</p> <p>2 remember.</p> <p>3 BY MR. WOJTANOWICZ:</p> <p>4 Q. So you've already testified that</p> <p>5 the Analysis Group helped you by writing some</p> <p>6 sections of the report and appendices. Did any</p> <p>7 others at Exponent write any of the -- or help</p> <p>8 you by writing sections of the report?</p> <p>9 MS. SMITH: Objection, form,</p> <p>10 compound. Misstates his testimony.</p> <p>11 THE WITNESS: So I mentioned</p> <p>12 the key staff that helped me draft the</p> <p>13 report. There were a few others that</p> <p>14 may have supported or done some QC of</p> <p>15 the report, but I can't remember who</p> <p>16 would have done what or all their names</p> <p>17 at this point.</p> <p>18 BY MR. WOJTANOWICZ:</p> <p>19 Q. Were there sections of the report</p> <p>20 that you personally consider yourself to be the</p> <p>21 principal drafter of?</p> <p>22 A. So I set forth the outline, the key</p> <p>23 points, the summaries and the opinions and then</p> <p>24 I typically start at all the different sections</p> <p>25 and then others kind of filled in based on my</p>	<p style="text-align: right;">Page 56</p> <p>1 after-treatment systems operate.</p> <p>2 Q. So, for example, if you turn to</p> <p>3 your report, Exhibit No. 1, near the back, and</p> <p>4 it gets kind of difficult because the pages</p> <p>5 aren't totally sequential through the</p> <p>6 appendices, but there's Appendix D, Overview of</p> <p>7 Diesel Vehicle Emissions. Is this one of the</p> <p>8 sections that was derived in whole or in part</p> <p>9 from work that you had performed in other</p> <p>10 diesel cases?</p> <p>11 MS. SMITH: I just want to</p> <p>12 just caution Mr. Harrington to the</p> <p>13 extent the work is as a consulting</p> <p>14 expert and has not been disclosed, I</p> <p>15 just want to be careful not to waive</p> <p>16 any privilege that he may have, that</p> <p>17 other companies may have or other</p> <p>18 entities may have.</p> <p>19 THE WITNESS: You said</p> <p>20 Appendix D, which page?</p> <p>21 BY MR. WOJTANOWICZ:</p> <p>22 Q. Well, Appendix D starts at page 1</p> <p>23 of Appendix D, but it's after the very end of</p> <p>24 your reliance materials section. There's no</p> <p>25 other way really to -- so after page C60, which</p>
<p style="text-align: right;">Page 55</p> <p>1 direction.</p> <p>2 Q. Did anyone other than people at</p> <p>3 Exponent and people at the Analysis Group draft</p> <p>4 any sections of the report or the appendices?</p> <p>5 A. No.</p> <p>6 Q. Did the lawyers representing GM or</p> <p>7 Bosch draft any sections of the report?</p> <p>8 A. They didn't draft any of it, no.</p> <p>9 Q. Was any part of the report,</p> <p>10 including the appendices, copied in whole or in</p> <p>11 part from work that you had performed or</p> <p>12 Exponent performed for purposes of another</p> <p>13 case?</p> <p>14 MS. SMITH: Objection, form.</p> <p>15 THE WITNESS: So I've done</p> <p>16 work on similar cases and so some of</p> <p>17 the kind of base materials may have</p> <p>18 been pulled from some other reports or</p> <p>19 other analyses we've done on similar</p> <p>20 cases where it's kind of, you know,</p> <p>21 background material or appendices.</p> <p>22 BY MR. WOJTANOWICZ:</p> <p>23 Q. What do you mean by base materials?</p> <p>24 A. It's kind of like the base research</p> <p>25 on regulations or how diesel engine</p>	<p style="text-align: right;">Page 57</p> <p>1 is page 60 of Appendix C.</p> <p>2 A. Yeah, we had a problem with the</p> <p>3 page number on the pdfs, so they're by</p> <p>4 sections. So you're asking about Appendix D,</p> <p>5 was there a particular page you were talking</p> <p>6 about in Appendix D?</p> <p>7 Q. No, I'm asking whether Appendix D</p> <p>8 was derived in whole or in part from work that</p> <p>9 you performed in other cases?</p> <p>10 MS. SMITH: Same objection.</p> <p>11 I just caution not to get into the</p> <p>12 substance of anything where you were an</p> <p>13 undisclosed expert or consultant.</p> <p>14 THE WITNESS: There are</p> <p>15 likely parts of that that could have</p> <p>16 been pulled from another report.</p> <p>17 BY MR. WOJTANOWICZ:</p> <p>18 Q. Do you know what report or what</p> <p>19 report in what case parts of this analysis may</p> <p>20 have been pulled from?</p> <p>21 MS. SMITH: And I'm just</p> <p>22 going to say, same instruction and to</p> <p>23 the extent any of that is confidential</p> <p>24 or you're concerned it's confidential,</p> <p>25 I would just caution you on how to</p>

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<p style="text-align: right;">Page 58</p> <p>1 answer. And, Garth, just so you know,  2 I have no idea, so if it is or it is  3 not, but I just want to be careful  4 here.</p> <p>5 THE WITNESS: So I don't --  6 there was some of the reports that were  7 privileged, still confidential, but I  8 believe there's some that were not in  9 relation to some Volkswagen cases that  10 some of this information or some of the  11 text could have come from in the  12 report.</p> <p>13 BY MR. WOJTANOWICZ:  14 Q. Were those -- so you referred to  15 some Volkswagen cases. Were those Volkswagen  16 cases relating to diesel emissions?  17 A. They were.  18 Q. And you say you're not sure whether  19 some of this analysis shown in Appendix D was  20 derived or taken from reports submitted in  21 these Volkswagen emission cases?  22 A. See, I don't know if they -- were,  23 how much they were changed, but -- and I would  24 have to go through it you know, line by line to  25 completely answer it, but some of the text and</p>	<p style="text-align: right;">Page 60</p> <p>1 BY MR. WOJTANOWICZ:  2 Q. I'm going ask you the same kind of  3 set of questions for Appendix E, which follows  4 Appendix D and Appendix D is about 12 pages  5 long, so not too much further down the line.  6 So my question is simply whether you believe  7 any of the analysis contained in Appendix E was  8 copied or derived from work contained in  9 another report submitted for purposes of a  10 different case?  11 MS. SMITH: Object to form.  12 THE WITNESS: So in Appendix  13 E, it does look like there is, you  14 know, some of the summaries of  15 emissions and tier two emissions came  16 from some of those other reports I  17 wrote --  18 THE STENOGRAPHER: And what?  19 Wait a minute, emissions and what?  20 THE WITNESS: It's omissions  21 and standards, I can't remember if  22 that's what I was going to say, but the  23 emissions and standards summaries,  24 portions of that came from other  25 reports or another report.</p>
<p style="text-align: right;">Page 59</p> <p>1 some of the images look like they were pulled  2 from that report.  3 Q. And were those -- was that a report  4 that was issued under your name? Were you the  5 person issuing this report in those cases that  6 you believe may or may not be the source of  7 some of the information in Appendix D?  8 MS. SMITH: Objection, form.  9 THE WITNESS: So yes, I was  10 the named expert and the me is I don't  11 know if things, you know, I can't  12 remember on some of these if they  13 changed a little bit, but there was for  14 sure some of this text or portions of  15 it that came from those other reports.</p> <p>16 BY MR. WOJTANOWICZ:  17 Q. We'll go through your list of cases  18 later. Do you think that if you hear the name  19 of the case you'll recognize it as being  20 potentially the source of some of the  21 information contained in Appendix D?  22 MS. SMITH: Objection, form.  23 THE WITNESS: I should be  24 able to to do that.  25</p>	<p style="text-align: right;">Page 61</p> <p>1 BY MR. WOJTANOWICZ:  2 Q. And is that, again, do you believe  3 that's from Volkswagen diesel emissions cases  4 as well or are you referring to a different  5 case or cases than we were talking about with  6 respect to Appendix D?  7 MS. SMITH: Objection, form.  8 THE WITNESS: The same  9 Volkswagen cases.  10 BY MR. WOJTANOWICZ:  11 Q. Did you conduct any vehicle tests  12 on your own in connection with your report in  13 this case?  14 MS. SMITH: Objection, form.  15 THE WITNESS: Could you  16 restate the question?  17 BY MR. WOJTANOWICZ:  18 Q. Did you conduct any vehicle  19 emissions tests in connection with your work in  20 this case?  21 A. So at the inspection, we analyzed  22 or we looked at the vehicle in the PEMS unit,  23 drove the vehicle, but there was no testing of  24 the emission system.  25 Q. So you said you're referring to the</p>

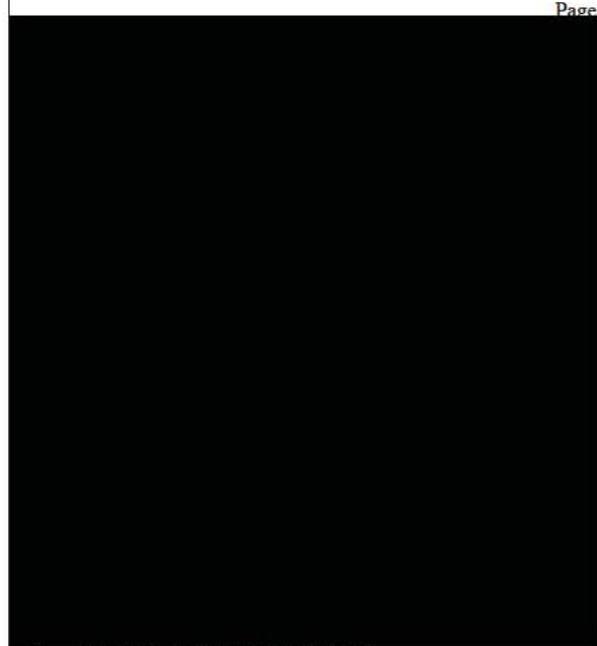
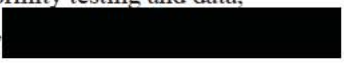
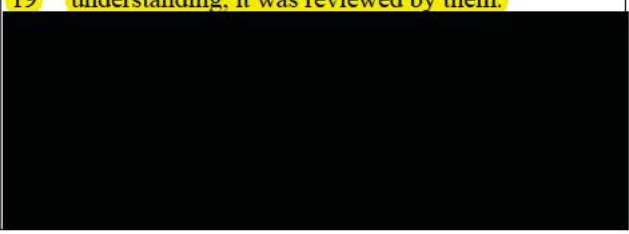


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<p style="text-align: right;">Page 62</p> <p>1 inspection of the Cruze diesel and gasoline</p> <p>2 test vehicles in this case, correct?</p> <p>3 A. Correct, we analyzed the vehicle</p> <p>4 and assessed the vehicle, but we didn't do any</p> <p>5 PEMS testing looking at the emissions of the</p> <p>6 vehicle.</p> <p>7 Q. Were you present at the vehicle</p> <p>8 inspection?</p> <p>9 A. I was not.</p> <p>10 Q. So and is it your understanding</p> <p>11 that the PEMS equipment that was used in</p> <p>12 connection with testing those vehicles was</p> <p>13 available at that vehicle inspection --</p> <p>14 A. Correct.</p> <p>15 Q. -- correct? But at that time,</p> <p>16 neither you nor anyone working under your</p> <p>17 direction attempted to perform an actual PEMS</p> <p>18 test using that equipment, correct?</p> <p>19 MS. SMITH: Objection, form.</p> <p>20 THE WITNESS: That is</p> <p>21 correct. We couldn't drive the vehicle</p> <p>22 off of our property, because the</p> <p>23 vehicle wasn't registered and the</p> <p>24 vehicle had active MIL lights and some</p> <p>25 other maintenance issues, so we were</p>	<p style="text-align: right;">Page 64</p> <p>1 A. No, I have not.</p> <p>2 Q. Did you -- in determining how you</p> <p>3 were going to perform your analysis in this</p> <p>4 case, did you consider conducting PEMS testing</p> <p>5 on a vehicle, the Cruze vehicle for this case?</p> <p>6 MS. SMITH: Objection, form.</p> <p>7 THE WITNESS: When I was</p> <p>8 first retained, you know, I was trying</p> <p>9 to understand the testing that</p> <p>10 Mr. Smithers had done and as I got into</p> <p>11 it and realized some of the methodology</p> <p>12 issues and the issues with the vehicle,</p> <p>13 there seemed to be so many issues with</p> <p>14 the vehicle that at that point it</p> <p>15 didn't seem necessary to do any</p> <p>16 additional testing.</p> <p>17 BY MR. WOJTANOWICZ:</p> <p>18 Q. So did you determine fairly early</p> <p>19 on in your review of the case that you didn't</p> <p>20 feel you needed to conduct any vehicle testing</p> <p>21 on your own, correct?</p> <p>22 MS. SMITH: Objection, form.</p> <p>23 THE WITNESS: It evolved</p> <p>24 over time, you know, there was some</p> <p>25 tighter deadlines and as things got</p>
<p style="text-align: right;">Page 63</p> <p>1 unable to do any testing.</p> <p>2 BY MR. WOJTANOWICZ:</p> <p>3 Q. The fact that you couldn't drive</p> <p>4 the vehicle off the property would not prevent</p> <p>5 you from actually hooking up and driving the</p> <p>6 vehicle with the PEMS equipment active, would</p> <p>7 it?</p> <p>8 MS. SMITH: Objection, form.</p> <p>9 THE WITNESS: No, we could</p> <p>10 have, but with the condition of the</p> <p>11 vehicle and, you know, driving around</p> <p>12 the test track would have been</p> <p>13 difficult to do any kind of, you know,</p> <p>14 on-road testing had, you know, there</p> <p>15 wasn't as much as value especially</p> <p>16 given the condition of the vehicle.</p> <p>17 BY MR. WOJTANOWICZ:</p> <p>18 Q. Aside from the vehicle inspection</p> <p>19 that people working under your direction</p> <p>20 attended, you have not conducted any PEMS</p> <p>21 testing of any Cruze vehicles for purposes of</p> <p>22 this report, correct?</p> <p>23 A. That is correct.</p> <p>24 Q. Have you ever performed emissions</p> <p>25 testing on any Cruze vehicle for any purpose?</p>	<p style="text-align: right;">Page 65</p> <p>1 extended, obviously, as I continued to</p> <p>2 evaluate the data by Mr. Smithers and</p> <p>3 his testing on the timelines, you know,</p> <p>4 I continued to evaluate that, but</p> <p>5 given, you know, early assessments and</p> <p>6 then the continued assessment, but it</p> <p>7 didn't change my opinion of that.</p> <p>8 BY MR. WOJTANOWICZ:</p> <p>9 Q. So I believe that the primary</p> <p>10 reason you stated for deciding you didn't want</p> <p>11 or need to conduct any emissions testing on a</p> <p>12 Cruze vehicle for this case was that you had</p> <p>13 identified what you thought were issues with</p> <p>14 the Cruze test vehicles, correct?</p> <p>15 MS. SMITH: I'm just going</p> <p>16 to object -- sorry, objection, form.</p> <p>17 And objection to the extent you're</p> <p>18 calling for a legal conclusion about</p> <p>19 what would be needed or not needed to</p> <p>20 do for this case.</p> <p>21 THE WITNESS: Could you</p> <p>22 restate the question or read it back?</p> <p>23 BY MR. WOJTANOWICZ:</p>




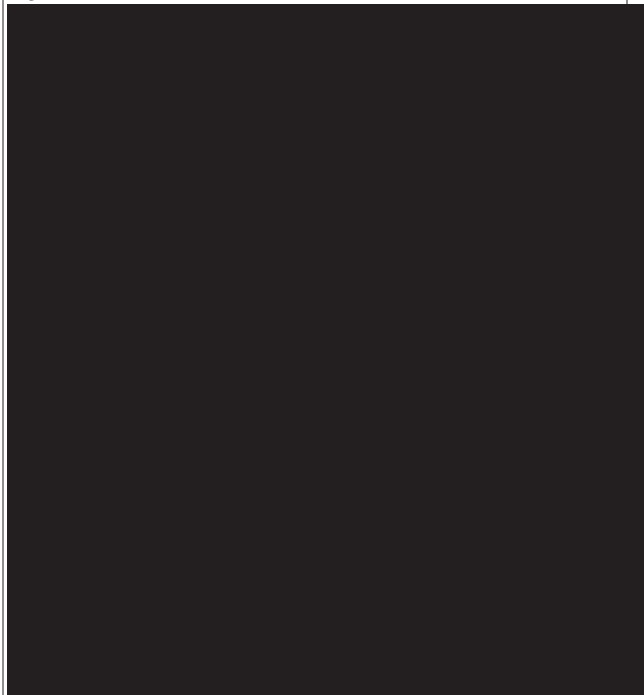


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<p style="text-align: right;">Page 66</p>  <p>19 BY MR. WOJTANOWICZ:  20 Q. So in your opinion, the data that  21 you were able to review from testing performed  22 by General Motors was sufficiently reliable for  23 you to rely on that date for purposes of  24 rendering your opinion in this case?  25 MS. SMITH: Objection, form.</p>	<p style="text-align: right;">Page 68</p> <p>1 Misstates testimony, vague.  2 THE WITNESS: So that data  3 in addition to the other data and  4 testing that GM needed to do to develop  5 a program.  6 BY MR. WOJTANOWICZ:  7 Q. But you felt that that testing was  8 sufficiently reliable for you to use it in  9 rendering your opinions in this case; that's  10 correct, right?  11 MS. SMITH: Objection, form.  12 THE WITNESS: So that  13 testing was reliable in addition to the  14 other information that was available.  15 BY MR. WOJTANOWICZ:  16 Q. Okay. But I'm trying to -- I want  17 to separate these. You said you had three  18 sources of the testing information that you  19 reviewed and relied on, one of them, the  20 certificate of conformity testing and data,  21 in-use testing data,   23 A. Correct.  24 Q. So the certificate of conformity  25 data, taking it by myself, did you consider</p>
<p style="text-align: right;">Page 67</p> <p>1 Objection, misstates his testimony.  2 THE WITNESS: So again, that  3 was a piece of it, right, so there was  4 some testing that was done there, but  5 there was some testing on additional  6 vehicles through the in-use program,  7 there was the certificate of conformity  8 data, so there was not just, you know,  9 one set of data or one vehicle tested,  10 there was multiple data and information  11 available for multiple vehicles.  12 BY MR. WOJTANOWICZ:  13 Q. Okay. So there was General Motors  14 testing data you were able to review relating  15 to its application in obtaining a certificate  16 of conformity for the Cruze vehicles, correct?  17 MS. SMITH: Objection, form.  18 THE WITNESS: That is  19 correct.  20 BY MR. WOJTANOWICZ:  21 Q. And based on your review, is your  22 opinion that data was sufficiently reliable for  23 you to use it in rendering your opinions in  24 this case?  25 MS. SMITH: Objection, form.</p>	<p style="text-align: right;">Page 69</p> <p>1 that data sufficiently reliable for you to use  2 it in connection with rendering the opinions in  3 your report?  4 A. So that data was reliable because  5 it was backed up by testing, you know, during  6 the development of the diesel Cruze and the  7 scrutiny of the EPA and the potential scrutiny  8 and audits that the EPA could have conducted on  9 that vehicle or some other vehicle.  10 Q. What about the in-use testing data  11 that you referred to, did you consider that  12 testing data to be sufficiently reliable for  13 you to use it in connection with rendering the  14 opinions stated in your report?  15 A. So I considered it reliable  16 information. I believe they tested, was it six  17 or seven, seven vehicles which was the results  18 were submitted to the EPA and CARB and my  19 understanding, it was reviewed by them.  </p>

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<p style="text-align: right;">Page 70</p>  <p>24 BY MR. WOJTANOWICZ: 25 Q. Now, you wouldn't have relied on</p>	<p style="text-align: right;">Page 72</p> <p>1 relying upon faulty data? 2 BY MR. WOJTANOWICZ: 3 Q. Yes. 4 A. If I know it's faulty, I will 5 investigate it and caveat what I know about it 6 and provide some context if I find something 7 that's unexpected about the data.</p>  <p>17 have been going for a little more than 18 an hour, I think now would be a good 19 time to take a short break before we 20 move on. Is that okay? 21 MS. SMITH: Yes, that's 22 fine. Thank you. 23 THE VIDEOGRAPHER: The time 24 is 11:26. We are off the record. 25 -----</p>
<p style="text-align: right;">Page 71</p> <p>1 the data if you believed that it was -- that 2 the tests were improperly conducted or the data 3 wasn't reliable, would you? 4 MS. SMITH: Objection, form. 5 THE WITNESS: Sorry, go 6 ahead. 7 MS. SMITH: Go ahead, sorry. 8 THE WITNESS: All right. So 9 could you clarify the statement, if I 10 knew what about the data? 11 BY MR. WOJTANOWICZ:</p>  <p>21 Q. Is it your practice to include or 22 rely upon faulty or false data in rendering 23 expert opinions in litigation? 24 MS. SMITH: Objection, form. 25 THE WITNESS: You said</p>	<p style="text-align: right;">Page 73</p> <p>1 (A recess was taken at this time.) 2 ----- 3 THE VIDEOGRAPHER: The time 4 is 11:43. We're on the record. 5 BY MR. WOJTANOWICZ:</p> 



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<p>1 and others, some emails about, you</p> <p>2 know, some questions they were asking</p> <p>3 about the PEMS data, so that's some of</p> <p>4 the information that I saw.</p> <p>5 BY MR. WOJTANOWICZ:</p> <p>6 Q. The bottom line is you don't know</p> <p>7 how deeply the EPA dug into any of this testing</p> <p>8 data other than the fact that this data was</p> <p>9 given to it, right?</p> <p>10 MS. SMITH: Objection, form.</p> <p>11 Misstates testimony.</p> <p>12 THE WITNESS: So that</p> <p>13 information is typically not made</p> <p>14 public. So I didn't see anything</p> <p>15 specific to that, you know, exactly</p> <p>16 what they did in relation to that data</p> <p>17 that was submitted.</p> <p>18 BY MR. WOJTANOWICZ:</p> <p>19 Q. Is it your opinion that any</p> <p>20 information submitted to the EPA is inherently</p> <p>21 reliable because of the potential scrutiny that</p> <p>22 it's subject to?</p> <p>23 A. Could you restate that question?</p> <p>24 Q. Is it your opinion that any</p> <p>25 information or data submitted to the EPA is</p>	<p>1 is really kind of the combination of</p> <p>2 the two of those is using a PEMS unit</p> <p>3 to do on-road testing of emissions.</p> <p>4 BY MR. WOJTANOWICZ:</p> <p>5 Q. Again, I am not asking about the</p> <p>6 other kinds of tests you may or may not have</p> <p>7 performed, I'm asking you specifically about</p> <p>8 PEMS testing for purposes of analyzing diesel</p> <p>9 vehicle emissions. So if you can answer my</p> <p>10 question, please. Have you ever conducted a</p> <p>11 PEMS test for the purpose of analyzing diesel</p> <p>12 vehicle emissions?</p> <p>13 MS. SMITH: Objection, form.</p> <p>14 THE WITNESS: I think I</p> <p>15 answered that, but I said I had not</p> <p>16 conducted PEMS testing. I provided</p> <p>17 some context to the other testing, but</p> <p>18 I think I clearly stated I hadn't</p> <p>19 conducted PEMS testing on a diesel</p> <p>20 vehicle.</p> <p>21 BY MR. WOJTANOWICZ:</p> <p>22 Q. Have you ever conducted a PEMS tes</p> <p>23 for purpose of analyzing emissions on a</p> <p>24 gasoline vehicle?</p> <p>25 A. I have not.</p>
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<p>1 inherently more reliable just because it's</p> <p>2 submitted to the EPA?</p> <p>3 A. I don't know if you can say it is</p> <p>4 inherently more reliable, but you're submitting</p> <p>5 it to an entity that has to look into it and,</p> <p>6 you know, or an OEM knows that that data and</p> <p>7 those test results can be audited by the EPA,</p> <p>8 so there's definitely increased scrutiny on the</p> <p>9 data and what's going to be done with it.</p> <p>10 Q. Have you ever conducted personally</p> <p>11 a PEMS tests on the vehicle?</p> <p>12 A. I have not conducted PEMS testing.</p> <p>13 I've conducted FTP testing, but not PEMS</p> <p>14 testing. And I've conducted a lot of on-road</p> <p>15 fuel economy testing, which has some of the</p> <p>16 inherent variability with PEMS testing.</p> <p>17 Q. But specifically with respect to</p> <p>18 PEMS testing for purposes of analyzing diesel</p> <p>19 vehicle emissions, you have never conducted a</p> <p>20 test like that, correct?</p> <p>21 MS. SMITH: Objection, form.</p> <p>22 THE WITNESS: I have not</p> <p>23 conducted PEMS testing. Again, I've</p> <p>24 conducted FTP testing for emissions and</p> <p>25 conducted on-road testing, which PEMS</p>	<p>1 Q. Have you ever designed test route</p> <p>2 for purpose of running a PEMS test to analyze</p> <p>3 emissions on a diesel or gasoline vehicle?</p> <p>4 MS. SMITH: Objection, form.</p> <p>5 THE WITNESS: I have not</p> <p>6 designed a route for PEMS testing.</p> <p>7 I've done, again, fuel economy testing</p> <p>8 for on road commissions and fuel</p> <p>9 economy, not a PEMS testing route.</p> <p>10 BY MR. WOJTANOWICZ:</p> <p>11 Q. Have you ever hooked up or set up a</p> <p>12 PEMS unit on a vehicle for purposes of</p> <p>13 emissions testing?</p> <p>14 A. I have not.</p> <p>15 Q. Have you ever hooked up -- or let</p> <p>16 me rephrase this. Have you ever directed that</p> <p>17 a PEMS unit be attached to a vehicle and then</p> <p>18 test it on a dynamometer for purposes of</p> <p>19 assessing whether the PEMS was accurate or not?</p> <p>20 MS. SMITH: Objection, form.</p> <p>21 THE WITNESS: I have not.</p> <p>22 BY MR. WOJTANOWICZ:</p> <p>23 Q. Have you ever designed a testing</p> <p>24 program using a PEMS unit for purposes of</p> <p>25 analyzing diesel or gas vehicle emissions?</p>

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<p style="text-align: right;">Page 82</p> <p>1 A. I have not.</p> <p>2 Q. Have you received any formal</p> <p>3 training in using a PEMS analyzer?</p> <p>4 A. Again, not a PEMS analyzer, I've</p> <p>5 done other emissions analytics, but not a</p> <p>6 specific PEMS unit.</p> <p>7 Q. Have you received, for example, any</p> <p>8 informal training, like attended a seminar or a</p> <p>9 demonstration by a manufacturer of a PEMS unit</p> <p>10 to learn how the PEMS unit works?</p> <p>11 MS. SMITH: Objection, form.</p> <p>12 THE WITNESS: I have not.</p> <p>13 BY MR. WOJTANOWICZ:</p> <p>14 Q. Was the use of a PEMS unit the part</p> <p>15 of any aspect of your formal education? I know</p> <p>16 we'll go into that later, but have you had any</p> <p>17 classes or formal university training that</p> <p>18 relates specifically to the use of a PEMS unit?</p> <p>19 A. When I went to school, PEMS units</p> <p>20 weren't typically in use or hadn't been very</p> <p>21 widespread in use.</p> <p>22 Q. Okay. So the answer is no, there</p> <p>23 weren't any classes offered at the time you</p> <p>24 were in school that related to how to set up or</p> <p>25 use a PEMS unit?</p>	<p style="text-align: right;">Page 84</p> <p>1 about how the Sensors, Inc. PEMS unit works?</p> <p>2 MS. SMITH: Objection, form.</p> <p>3 THE WITNESS: I don't</p> <p>4 remember if I asked him to call or if I</p> <p>5 had asked him some questions and he</p> <p>6 thought it was -- he needed to clarify</p> <p>7 it with them, I can't remember the</p> <p>8 exact specifics of the conversation.</p> <p>9 BY MR. WOJTANOWICZ:</p> <p>10 Q. You're aware, aren't you, that</p> <p>11 Sensors, Inc. was the manufacturer of the PEMS</p> <p>12 unit that Mr. Smithers used in his testing</p> <p>13 program?</p> <p>14 A. Yes, the Semtech unit, yes.</p> <p>15 Q. Have you personally reviewed the</p> <p>16 user's manuals or the manuals for the Semtech</p> <p>17 PEMS unit?</p> <p>18 MS. SMITH: Objection, form.</p> <p>19 THE WITNESS: I can't say</p> <p>20 that I reviewed every aspect of it, but</p> <p>21 I did review the materials and some of</p> <p>22 the owner's manual pieces of that</p> <p>23 Semtech unit.</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. What parts of the owner's manual do</p>
<p style="text-align: right;">Page 83</p> <p>1 A. Not specific to a PEMS unit, no.</p> <p>2 It was on-road testing in itself.</p> <p>3 Q. In connection with your work on</p> <p>4 this case, have you spoken with any PEMS unit</p> <p>5 manufacturers regarding the proper use of PEMS</p> <p>6 equipment?</p> <p>7 A. I have not. Jeff Wishart who works</p> <p>8 for me has done some PEMS testing and been a</p> <p>9 part of PEMS testing, so I had spoke to him</p> <p>10 about some the aspects of it.</p> <p>11 Q. But you personally did not reach</p> <p>12 out to, for example, Sensors, Inc. in order to</p> <p>13 ask them about how their PEMS unit that they</p> <p>14 manufacture works, did you?</p> <p>15 A. I did not reach out to them.</p> <p>16 Q. Did you ask Mr. Wishart to do that</p> <p>17 for you?</p> <p>18 A. I can't remember if he had</p> <p>19 looked -- he looked into some of their manuals</p> <p>20 and I can't remember if he called to clarify a</p> <p>21 few different aspects, but I know he'd reviewed</p> <p>22 their manuals and there may have been a phone</p> <p>23 call, but I can't remember for sure.</p> <p>24 Q. Did you ask him to call the</p> <p>25 manufacturer to get additional information</p>	<p style="text-align: right;">Page 85</p> <p>1 you recall reviewing?</p> <p>2 A. There was the discussion of</p> <p>3 operating PEMS temperatures. I think some of</p> <p>4 the setup pieces, but it was a while ago, so I</p> <p>5 can't remember the exact sections.</p> <p>6 Q. Have you ever testified as an</p> <p>7 expert witness in a case about PEMS testing</p> <p>8 other than the testimony you're providing right</p> <p>9 now in this case?</p> <p>10 A. I have got to think if any of that</p> <p>11 was confidential and privileged. I don't</p> <p>12 believe it is in relation to some of the other</p> <p>13 cases that we had mentioned before, I had</p> <p>14 testified to some of the results of some PEMS</p> <p>15 testing.</p> <p>16 Q. In what cases?</p> <p>17 A. Those would have been the</p> <p>18 Volkswagen cases.</p> <p>19 Q. And were you testifying with</p> <p>20 respect to PEMS testing conducted by Exponent</p> <p>21 or by someone else?</p> <p>22 MS. SMITH: Objection, form.</p> <p>23 THE WITNESS: It would have</p> <p>24 been by Volkswagen and West Virginia</p> <p>25 University.</p>

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<p style="text-align: right;">Page 86</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. So in that case, you were able to</p> <p>3 analyze some PEMS test results conducted by</p> <p>4 Volkswagen on its own vehicles; is that</p> <p>5 correct?</p> <p>6 A. And West Virginia's PEMS testing,</p> <p>7 correct.</p> <p>8 Q. And the West Virginia PEMS testing,</p> <p>9 was that a study done by some people at West</p> <p>10 Virginia University related to diesel vehicle</p> <p>11 emissions using analyzed using a PEMS setup?</p> <p>12 A. That is correct.</p> <p>13 Q. And you provided deposition</p> <p>14 testimony is that case; is that correct?</p> <p>15 A. That is correct.</p> <p>16 Q. Did you or anyone under your</p> <p>17 direction perform PEMS testing with respect to</p> <p>18 that Volkswagen case where you offered</p> <p>19 testimony relating to PEMS testing?</p> <p>20 A. No.</p> <p>21 Q. Did you issue a written report in</p> <p>22 that case?</p> <p>23 A. Yes.</p> <p>24 Q. And you said then you provided</p> <p>25 testimony that was deposition testimony?</p>	<p style="text-align: right;">Page 88</p> <p>1 written report. The California arbitration</p> <p>2 cases are a little bit different, but the other</p> <p>3 ones had a full report with them.</p> <p>4 Q. Have you ever been asked to conduct</p> <p>5 PEMS testing on a vehicle for purposes other</p> <p>6 than litigation? And to the extent that you</p> <p>7 are -- were asked as a consulting expert, I</p> <p>8 don't know the substance, I want to know</p> <p>9 whether you have been asked to actually just</p> <p>10 conduct a PEMS testing for purposes other than</p> <p>11 the litigation?</p> <p>12 A. I can't recall a request like that.</p> <p>13 Q. Have you ever been asked to</p> <p>14 interpret or analyze the validity of PEMS</p> <p>15 testing data for purposes other than</p> <p>16 litigation?</p> <p>17 A. Not off the top of my head, I can't</p> <p>18 recall a request like that.</p> <p>19 Q. And then a slight variation on</p> <p>20 these questions and, again, without wanting to</p> <p>21 know the substance, have you ever conducted</p> <p>22 PEMS testing for purposes of litigation where</p> <p>23 you were not disclosed as a testifying expert?</p> <p>24 A. No.</p> <p>25 Q. Have you ever been in a situation</p>
<p style="text-align: right;">Page 87</p> <p>1 A. Correct.</p> <p>2 Q. Was there a trial? Did you give</p> <p>3 any trial testimony?</p> <p>4 A. I did not.</p> <p>5 Q. Okay. Any other case that you are</p> <p>6 aware of or that you recall in which you</p> <p>7 provided testimony regarding PEMS testing?</p> <p>8 A. No, there was -- it's, obviously,</p> <p>9 in my appendix, there was some arbitrations</p> <p>10 that were related to Volkswagen that would have</p> <p>11 been the similar opinions, but I think that was</p> <p>12 all confidential, but it's very similar to the</p> <p>13 other reports that I mentioned.</p> <p>14 Q. Okay. And we'll go through those</p> <p>15 later, but and I was just trying to, for the</p> <p>16 purpose of fairness, those are cases that you</p> <p>17 provided testimony, like, where you actually</p> <p>18 gave deposition or trial testimony; is that</p> <p>19 correct?</p> <p>20 A. Deposition or arbitration</p> <p>21 testimony, correct.</p> <p>22 Q. Okay. In all of those cases, did</p> <p>23 you also provide written reports that related</p> <p>24 to your opinions regarding PEMS testing?</p> <p>25 A. Yes, there should have been a</p>	<p style="text-align: right;">Page 89</p> <p>1 where you directed other people to conduct PEMS</p> <p>2 testing for you for purposes of litigation</p> <p>3 where you were working under the auspices of</p> <p>4 being a consultant, not a testifying expert?</p> <p>5 A. No.</p> <p>6 Q. Did you conduct any tests on PEMS</p> <p>7 equipment, meaning any tests analyzing how PEMS</p> <p>8 equipment works in connection with your work in</p> <p>9 this case?</p> <p>10 MS. SMITH: Objection, form.</p> <p>11 THE WITNESS: Could you ask</p> <p>12 the question again?</p> <p>13 BY MR. WOJTANOWICZ:</p> <p>14 Q. Sure. Did you personally, let's</p> <p>15 start personally, did you personally conduct</p> <p>16 any tests of PEMS equipment in connection with</p> <p>17 your opinions in this case?</p> <p>18 A. Other than what was done at the</p> <p>19 inspection, which wasn't testing of the system</p> <p>20 per se, no.</p> <p>21 Q. So you weren't present at the</p> <p>22 inspection, correct?</p> <p>23 A. I think I've stated that before,</p> <p>24 that's correct.</p> <p>25 Q. So then it's true, isn't it, that</p>

23 (Pages 86 - 89)



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<p style="text-align: right;">Page 90</p> <p>1 you have not conducted any testing on PEMS 2 equipment for purposes of this opinion 3 personally? 4 A. That is correct. 5 Q. Now, you're aware that during the 6 vehicle inspection of the test Cruze vehicles 7 in this case, that the PEMS units were present 8 at the inspection and available for inspection 9 as well, correct? 10 MS. SMITH: Objection, form. 11 THE WITNESS: Correct. 12 BY MR. WOJTANOWICZ: 13 Q. Are you aware that those machines 14 were not tested or analyzed during that 15 inspection? 16 MS. SMITH: Objection, form. 17 foundation. 18 THE WITNESS: They were 19 what? 20 BY MR. WOJTANOWICZ: 21 Q. Are you aware that those machines 22 were not tested or analyzed during those 23 vehicle inspections? 24 A. My understanding, they were 25 inspected, but they were not, yes, tested,</p>	<p style="text-align: right;">Page 92</p> <p>1 the PEMS equipment, that's correct. 2 Q. Are you aware of the process by 3 which the PEMS units can be calibrated to 4 determine if they're measuring the correct 5 amount of gas? 6 A. So my understanding is that the 7 exhaust flow meter is calibrated by the Semtech 8 unit itself and then before and after the test, 9 you need to do a zero and span gas test, which 10 is not something that Mr. Smithers stated in 11 his report and we tried to track down if that 12 information exists, but that wasn't mentioned 13 in his report, but he did say he calibrated 14 them before and after, but I never saw anything 15 about the span or zero gas that he used. 16 BY MR. WOJTANOWICZ: 17 Q. And you didn't instruct the people 18 attending the inspection on your behalf to 19 perform a zero and span test, did you? 20 A. That's my understanding, I don't 21 remember asking them to do them. 22 Q. Why not? 23 A. Because we weren't -- we weren't 24 doing testing, so, you know, we could have 25 looked at the calibration at that point, but</p>
<p style="text-align: right;">Page 91</p> <p>1 during the inspection. 2 Q. Are you aware that the machines 3 were not even turned on by the people 4 conducting the inspection? 5 MS. SMITH: Objection, form. 6 THE WITNESS: I can't 7 remember exactly, but that seems 8 consistent with my understanding. 9 BY MR. WOJTANOWICZ: 10 Q. Did you ask the people attending 11 that inspection under your direction to perform 12 any tests on the PEMS units? 13 A. No, I had asked them, given the 14 time that we had, to just inspect the vehicle 15 and the PEMS equipment, but because we weren't 16 going to be doing any PEMS testing, it was 17 limited to just inspecting the vehicle -- or 18 the vehicle and the PEMS plumbing, anything 19 kind of visual that would have been 20 problematic. 21 Q. So you just asked them to do a 22 visual inspection of the PEMS equipment that 23 was present at the inspection? 24 A. To do what was possible during the 25 day to look at those vehicles, or to look at</p>	<p style="text-align: right;">Page 93</p> <p>1 that wouldn't have told us anything about the 2 calibrations or how the system was operating 3 when Mr. Smithers was doing his testing. 4 Q. Other than requesting a visual 5 inspection of the PEMS units, did you ask the 6 people attending the inspection on your behalf 7 to conduct any other inspection or analysis of 8 the PEMS equipment used in Mr. Smithers' 9 testing? 10 A. At this point, I can't recall any 11 other requests that I would have made at that 12 point. 13 Q. Regarding that inspection, did you 14 personally design or specify what actions were 15 to be taken during the vehicle inspection? 16 A. Yes, so I had talked to Peter and 17 Jeff about what we were looking to do during 18 the inspection, some of the things to look at, 19 and then, you know, used some of their input as 20 well having done work and especially with 21 Peter's doing quite a few vehicle inspections, 22 we talked through what we would need to look at 23 and do during that inspection. 24 Q. Did you generate like a written 25 protocol for what the inspection procedures</p>

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<p style="text-align: right;">Page 94</p> <p>1 were supposed to be?</p> <p>2 A. So my memory is that it was verbal.</p> <p>3 There may have been a protocol, but for some</p> <p>4 reason, I can't remember if there was one.</p> <p>5 There was one I know when I think it was shared</p> <p>6 with you, you know, talking about what was</p> <p>7 going to be done at the inspection. That was</p> <p>8 something that, you know, was written down</p> <p>9 about what was going to be done during the</p> <p>10 inspection at kind of a high level.</p> <p>11 Q. So that protocol, you're referring</p> <p>12 to the protocol agreed to among the parties for</p> <p>13 what things could be inspected and what kind of</p> <p>14 notice needed to be provided; is that correct?</p> <p>15 MS. SMITH: Objection, form.</p> <p>16 THE WITNESS: That's</p> <p>17 correct.</p> <p>18 BY MR. WOJTANOWICZ:</p> <p>19 Q. Aside from that, you're not aware</p> <p>20 of any other written protocol detailing the</p> <p>21 steps that you wanted to have taken during this</p> <p>22 vehicle inspection?</p> <p>23 A. Since it was a one-day test, and</p> <p>24 you know, just an inspection, or one-day</p> <p>25 inspection, we weren't doing testing, I believe</p>	<p style="text-align: right;">Page 96</p> <p>1 Q. Were you aware that as part of the</p> <p>2 vehicle inspection protocol you referred to</p> <p>3 earlier, the parties were supposed to exchange</p> <p>4 any information that they gleaned during the</p> <p>5 course of the inspection?</p> <p>6 MS. SMITH: Objection.</p> <p>7 Objection. That protocol speaks for</p> <p>8 itself and to the extent that it calls</p> <p>9 for a legal conclusion and foundation</p> <p>10 on what was required and agreed to</p> <p>11 among the attorneys.</p> <p>12 MR. WOJTANOWICZ: You can</p> <p>13 answer.</p> <p>14 THE WITNESS: Can you ask</p> <p>15 the question again?</p> <p>16 BY MR. WOJTANOWICZ:</p> <p>17 Q. Were you aware that the protocol,</p> <p>18 the inspection protocol we referred to earlier</p> <p>19 called for the parties to exchange information</p> <p>20 they gleaned during the course of that</p> <p>21 inspection?</p> <p>22 MS. SMITH: Same objection.</p> <p>23 THE WITNESS: It has been a</p> <p>24 while since I read it. I vaguely</p> <p>25 remember something about, yeah, the</p>
<p style="text-align: right;">Page 95</p> <p>1 it was all verbal, but I would have to go back</p> <p>2 and see if something was documented, but I</p> <p>3 don't remember off the top of my head.</p> <p>4 Q. You say you weren't doing testing,</p> <p>5 but the people working for you did actually</p> <p>6 take both vehicles out for test drives; isn't</p> <p>7 that right?</p> <p>8 A. Correct. So a good clarification,</p> <p>9 so there was test drives, there wasn't</p> <p>10 emissions testing being done that day.</p> <p>11 Q. So where are the written protocols</p> <p>12 for how the people working for you at that</p> <p>13 inspection were supposed to conduct those test</p> <p>14 drives?</p> <p>15 A. So, again, I can't remember if they</p> <p>16 were documented or they weren't. So if they</p> <p>17 were, I can try to find them, but I can't</p> <p>18 remember at this point.</p> <p>19 Q. Okay. If they were, would you have</p> <p>20 cited them in your report as among the</p> <p>21 materials you relied on in rendering your</p> <p>22 opinions in this case?</p> <p>23 A. Yes, unless I had forgotten about</p> <p>24 them, but typically, we would have, so we can</p> <p>25 go back and see if there is something.</p>	<p style="text-align: right;">Page 97</p> <p>1 information needed to be exchanged, but</p> <p>2 I don't remember the specifics that was</p> <p>3 listed in there.</p> <p>4 BY MR. WOJTANOWICZ:</p> <p>5 Q. Do you know whether all of the</p> <p>6 information that the people working under your</p> <p>7 direction obtained from that inspection was</p> <p>8 provided to Plaintiffs in this case?</p> <p>9 MS. SMITH: Objection, form,</p> <p>10 foundation.</p> <p>11 THE WITNESS: That's my</p> <p>12 understanding.</p> <p>13 BY MR. WOJTANOWICZ:</p> <p>14 Q. Did you provide all of the</p> <p>15 information that the people working for you</p> <p>16 gathered at that inspection to counsel for that</p> <p>17 purpose or for any purpose?</p> <p>18 A. That's my understanding.</p> <p>19 Q. Were you aware that there were --</p> <p>20 no, let me back up a little bit. How, if at</p> <p>21 all, did you learn about what happened during</p> <p>22 the course of that vehicle inspection?</p> <p>23 A. I talked to Peter and Jeff about</p> <p>24 what they had found, had run through kind of</p> <p>25 some of their findings and then asked them to</p>

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<p style="text-align: right;">Page 98</p> <p>1 draft those sections kind of outlining what the</p> <p>2 findings were for the report.</p> <p>3 Q. Peter and Jeff, you're referring to</p> <p>4 Peter Lillo and Jeff Wishart?</p> <p>5 A. Yes, sorry, correct.</p> <p>6 Q. So there was, you had a verbal</p> <p>7 exchange with those two individuals regarding</p> <p>8 what they observed during the course of the</p> <p>9 inspection, correct?</p> <p>10 A. Correct.</p> <p>11 Q. Did they summarize their findings</p> <p>12 for you in any way?</p> <p>13 A. So the summaries are what's in the</p> <p>14 report.</p> <p>15 Q. So other than the sections that you</p> <p>16 asked them to draft in the report related to</p> <p>17 the inspection, there were no other summaries</p> <p>18 that they made for you of what they observed</p> <p>19 during the inspection?</p> <p>20 MS. SMITH: Objection, form.</p> <p>21 THE WITNESS: Yeah, that's</p> <p>22 my memory is that everything was just</p> <p>23 drafted into the report.</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. Now, I mean, this report doesn't</p>	<p style="text-align: right;">Page 100</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. And the two ways that you were able</p> <p>3 to determine what they had gleaned and their</p> <p>4 expertise were the verbal conversation you had</p> <p>5 with them and the information that they put</p> <p>6 into the draft report; isn't that right?</p> <p>7 A. That is correct.</p> <p>8 Q. Are you aware that there were other</p> <p>9 people at the vehicle inspection associated</p> <p>10 with other parties -- parties other than</p> <p>11 Exponent and other than Plaintiffs? In other</p> <p>12 words, there were third-parties' experts, for</p> <p>13 lack of a better term, present at the vehicle</p> <p>14 inspection?</p> <p>15 MS. SMITH: Objection, form.</p> <p>16 THE WITNESS: You said third</p> <p>17 parties? I guess, I'm not sure who</p> <p>18 you're talking about.</p> <p>19 BY MR. WOJTANOWICZ:</p> <p>20 Q. Okay. Let me just rephrase this.</p> <p>21 Is it your understanding that there were</p> <p>22 consultants or experts associated with Bosch,</p> <p>23 the Defendant Bosch in this case that were also</p> <p>24 present at the inspection?</p> <p>25 MS. SMITH: Objection, form.</p>
<p style="text-align: right;">Page 99</p> <p>1 have Jeffrey Lillo -- I'm sorry, I'm mixing</p> <p>2 them up. It doesn't have Peter Lillo's name on</p> <p>3 it, does it?</p> <p>4 MS. SMITH: Objection, form.</p> <p>5 THE WITNESS: Sorry. It</p> <p>6 does not.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. It doesn't have Jeffrey Wishart's</p> <p>9 name on it, does it?</p> <p>10 A. That's correct. Again, as I stated</p> <p>11 in the beginning, so everything was done at my</p> <p>12 direction and I had staff help draft certain</p> <p>13 sections of the report.</p> <p>14 Q. And so because ultimately this</p> <p>15 report is intended to reflect your professional</p> <p>16 opinion and your engineering judgment, in order</p> <p>17 to do that, you had to rely on the information</p> <p>18 that Peter and Jeff put into the draft that</p> <p>19 they made summarizing what they observed during</p> <p>20 the inspection; isn't that right?</p> <p>21 MS. SMITH: Objection, form.</p> <p>22 THE WITNESS: So I</p> <p>23 considered the information they gleaned</p> <p>24 and their expertise coupled with my own</p> <p>25 expertise, that's correct.</p>	<p style="text-align: right;">Page 101</p> <p>1 THE WITNESS: My</p> <p>2 understanding is that Bosch had some</p> <p>3 representatives there. I don't</p> <p>4 remember exactly who they were, but I</p> <p>5 was aware that Bosch had some</p> <p>6 representatives there.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. Were you aware that General Motors</p> <p>9 also had some representatives there who were</p> <p>10 not employees of Exponent?</p> <p>11 MS. SMITH: Objection, form.</p> <p>12 THE WITNESS: I don't</p> <p>13 remember General Motors</p> <p>14 representatives, no, I don't remember</p> <p>15 who they were.</p> <p>16 BY MR. WOJTANOWICZ:</p> <p>17 Q. Did you speak with anyone other</p> <p>18 than Peter and Jeff from Exponent about what</p> <p>19 was observed or what data was gleaned from the</p> <p>20 vehicle inspection?</p> <p>21 MS. SMITH: I'm just going</p> <p>22 to instruct not to answer to the extent</p> <p>23 it would reveal substance of</p> <p>24 communications with counsel.</p> <p>25 THE WITNESS: Discussions of</p>



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<p style="text-align: right;">Page 110</p> <p>1 for you, Peter and Jeff, with instructions</p> <p>2 about the speeds that they should achieve</p> <p>3 during the course of the test drive of the</p> <p>4 diesel test vehicle?</p> <p>5 A. I don't remember a specific</p> <p>6 discussion other than, you know, drive some,</p> <p>7 stop and go, and some high speed driving, but</p> <p>8 it wasn't a prescriptive profile, no.</p> <p>9 Q. And these were oral instructions,</p> <p>10 it wasn't a written protocol for how to conduct</p> <p>11 these tests?</p> <p>12 A. That's correct. It was more of a</p> <p>13 test drive, not an actual emissions test.</p> <p>14 Q. Okay. Did you provide Peter and</p> <p>15 Jeff with instructions about the duration of</p> <p>16 time as opposed to length and distance that</p> <p>17 they should conduct their test drive of the</p> <p>18 diesel test vehicle?</p> <p>19 MS. SMITH: Objection, form.</p> <p>20 THE WITNESS: Again, since</p> <p>21 we weren't doing any affirmative</p> <p>22 testing, I don't think there was any</p> <p>23 specifics about the amount of time to</p> <p>24 drive the vehicle.</p> <p>25</p>	<p style="text-align: right;">Page 112</p> <p>1 Q. Sure. I'm just asking aside from</p> <p>2 the inspections of the test vehicles we have</p> <p>3 been discussing, have you or anyone working</p> <p>4 under your direction conducted any other</p> <p>5 inspection of a Cruze vehicle in connection</p> <p>6 with your work in this case?</p> <p>7 A. No.</p> <p>8 Q. Have you ever inspected any other</p> <p>9 Cruze vehicle for any other purpose?</p> <p>10 A. Not that I can recall.</p> <p>11 Q. So you identified earlier, you said</p> <p>12 that Jeff Wishart had experience with PEMS</p> <p>13 testing, correct?</p> <p>14 A. He had been part of system PEMS</p> <p>15 testing, that's correct.</p> <p>16 Q. Is there anyone else who was</p> <p>17 working on, among the people assisting you in</p> <p>18 your work in this case, that to your knowledge</p> <p>19 has experience with PEMS testing?</p> <p>20 A. There's others that have done</p> <p>21 emissions testing, but specific to PEMS, I do</p> <p>22 not believe so.</p> <p>23 Q. For purposes of your opinions in</p> <p>24 this case to the extent that you are relying on</p> <p>25 inputs from your team, is it fair to say Jeff</p>
<p style="text-align: right;">Page 111</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Did you instruct Peter and Jeff</p> <p>3 with respect to the length of time, distance,</p> <p>4 that the gas test vehicle should be driven?</p> <p>5 MS. SMITH: Objection, form.</p> <p>6 THE WITNESS: No, if I</p> <p>7 remember correctly, it was the same</p> <p>8 instructions for the diesel or</p> <p>9 something similar to it.</p> <p>10 BY MR. WOJTANOWICZ:</p> <p>11 Q. Did you give them specific</p> <p>12 instructions not to use an active OBD logger</p> <p>13 during their test drive of the gas test</p> <p>14 vehicle?</p> <p>15 A. I don't remember a discussion about</p> <p>16 that.</p> <p>17 Q. Setting aside the inspections that</p> <p>18 were done by Peter and Jeff for you on the gas</p> <p>19 and diesel test vehicles, did you or anyone</p> <p>20 working under your direction conduct any other</p> <p>21 inspections of Cruze vehicles in connection</p> <p>22 with your work in this case?</p> <p>23 A. Sorry, something popped up and</p> <p>24 blurred part of your question there. Could you</p> <p>25 restate it?</p>	<p style="text-align: right;">Page 113</p> <p>1 Wishart is the one whose experience you were</p> <p>2 drawing on to reach your opinions in this case?</p> <p>3 MS. SMITH: Objection, form.</p> <p>4 THE WITNESS: So in part,</p> <p>5 some of his information, myself and my</p> <p>6 staff have done some work looking at</p> <p>7 PEMS data, understanding, you know,</p> <p>8 best practices with PEMS data, how it</p> <p>9 has been conducted and, again, you</p> <p>10 know, PEMS data is really the</p> <p>11 culmination of dyno testing with</p> <p>12 on-road testing, so the same principles</p> <p>13 apply. But as it relates to PEMS, Jeff</p> <p>14 would have been the one with the</p> <p>15 experience.</p> <p>16 BY MR. WOJTANOWICZ:</p> <p>17 Q. Is there anybody else who assisted</p> <p>18 you in this case whose experience with PEMS</p> <p>19 testing you relied on in reaching your opinions</p> <p>20 in this case?</p> <p>21 A. No.</p> <p>22 Q. What's your understanding of Jeff</p> <p>23 Wishart's educational background?</p> <p>24 A. So he has a Ph.D from Arizona State</p> <p>25 University. I believe it's in either</p>



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<p style="text-align: right;">Page 114</p> <p>1 mechanical engineering or engineering</p> <p>2 mechanics.</p> <p>3 Q. Do you have any idea what his work</p> <p>4 background is, where he has worked before</p> <p>5 Exponent?</p> <p>6 A. He worked at Intertek for a time, I</p> <p>7 think on electric vehicle and plug-in vehicle</p> <p>8 testing and where he did some PEMS testing.</p> <p>9 And he worked for a couple of other energy</p> <p>10 providers and then he was an adjunct professor</p> <p>11 at Arizona State University. I can't remember</p> <p>12 the exact -- or which department it is, but</p> <p>13 there's classes on vehicles and energy that he</p> <p>14 teaches.</p> <p>15 Q. I'm a little confused. You said</p> <p>16 that he worked for an electrical and plug-in</p> <p>17 vehicle manufacturer; is that right?</p> <p>18 A. I'm sorry, at Intertek, he did some</p> <p>19 test on plug-in hybrid and hybrid vehicles, so</p> <p>20 vehicle testing and emissions testing.</p> <p>21 Q. So hybrid vehicles as well, not</p> <p>22 just full electric vehicles?</p> <p>23 A. I believe so, that is correct, but</p> <p>24 I would have to double check on that, but I</p> <p>25 thought it was plug in, hybrid, and electric</p>	<p style="text-align: right;">Page 116</p> <p>1 in vehicles or in the energy space. I think</p> <p>2 it's between 10 or 15 years, including some of</p> <p>3 his academic roles.</p> <p>4 Q. Do you know approximately how old</p> <p>5 he is just to get a sense of how long he has</p> <p>6 been out in the workforce as opposed to just</p> <p>7 being in school?</p> <p>8 MS. SMITH: Objection, form.</p> <p>9 THE WITNESS: Actually, I do</p> <p>10 not know how old he is. And I guess I</p> <p>11 could go back and look at when he</p> <p>12 graduated, but I don't know how old he</p> <p>13 is.</p> <p>14 BY MR. WOJTANOWICZ:</p> <p>15 Q. Can you ballpark it, does he appear</p> <p>16 to be under 40, under 50?</p> <p>17 MS. SMITH: Objection, form.</p> <p>18 THE WITNESS: If I had to</p> <p>19 guess, he's probably in his thirties or</p> <p>20 forties.</p> <p>21 BY MR. WOJTANOWICZ:</p> <p>22 Q. What training has Mr. Wishart had</p> <p>23 in conducting PEMS tests?</p> <p>24 A. I don't know if I can remember the</p> <p>25 testing he's had. I believe he had worked with</p>
<p style="text-align: right;">Page 115</p> <p>1 vehicles.</p> <p>2 Q. Okay. Unless I'm way off track</p> <p>3 here, I don't see why a person would do a PEMS</p> <p>4 test on a full electric vehicle. That's not</p> <p>5 something that would be done, correct?</p> <p>6 A. Correct.</p> <p>7 Q. How long has he been with, has Mr.</p> <p>8 Wishart been with Exponent?</p> <p>9 A. I think it is between a year and a</p> <p>10 half, I think a year and a half, something like</p> <p>11 that. Year and a half to two years.</p> <p>12 Q. Do you know whether Mr. Wishart has</p> <p>13 performed any PEMS tests during the time that</p> <p>14 he has been at Exponent?</p> <p>15 A. I don't know if he's actually</p> <p>16 conducted PEMS testing while at Exponent.</p> <p>17 Q. Do you know approximately for how</p> <p>18 long Mr. Wishart worked at Intertek?</p> <p>19 A. I don't have his CV in front of me.</p> <p>20 Going off memory I thought it was between two</p> <p>21 and four years, something like that.</p> <p>22 Q. Do you have an understanding of</p> <p>23 approximately how long Mr. Wishart has been</p> <p>24 working as an engineer in this field?</p> <p>25 A. I think most of his work was either</p>	<p style="text-align: right;">Page 117</p> <p>1 one of the manufacturers prior to coming to</p> <p>2 Exponent and I think he's had some either</p> <p>3 training or some work with a manufacturer at</p> <p>4 some point during his time at Exponent.</p> <p>5 Q. A manufacturer of what?</p> <p>6 A. A manufacturer of a PEMS unit.</p> <p>7 Q. Is it your understanding you</p> <p>8 believe that he actually worked for one of the</p> <p>9 manufacturers of PEMS units?</p> <p>10 A. No. Did I state that?</p> <p>11 Q. That was what I understood. That's</p> <p>12 why I was asking the clarifying question.</p> <p>13 A. Sorry. No, no, he had interacted</p> <p>14 with or had some training with a manufacturer</p> <p>15 of a PEMS unit, he hadn't worked for them.</p> <p>16 Q. All right. So you believe that he</p> <p>17 may have received some training from one of the</p> <p>18 PEMS unit manufacturers. Do you know the</p> <p>19 nature of that training?</p> <p>20 A. I don't. He's out in our Phoenix</p> <p>21 office and I can't remember the specifics of</p> <p>22 when or where that was, but we had a</p> <p>23 conversation a while ago about some of the</p> <p>24 training that he had been doing and</p> <p>25 conversations he's had, but I don't remember</p>

30 (Pages 114 - 117)

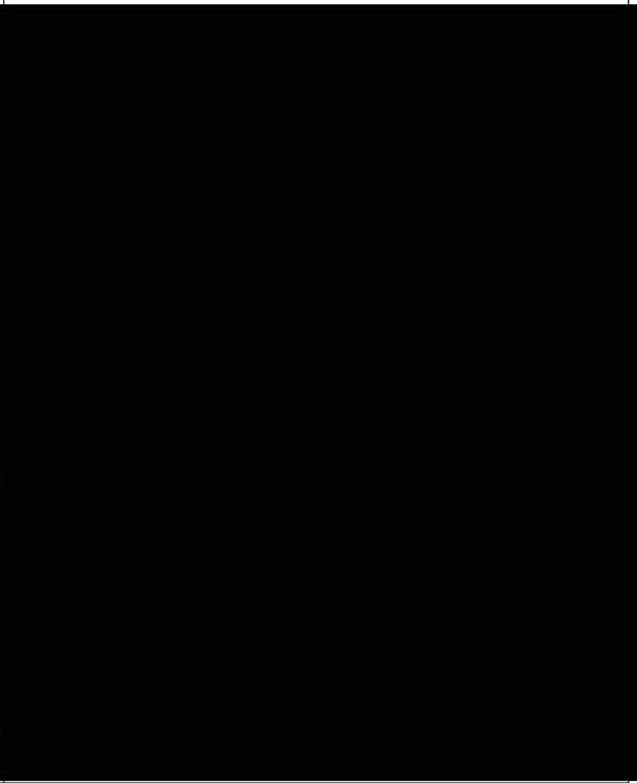
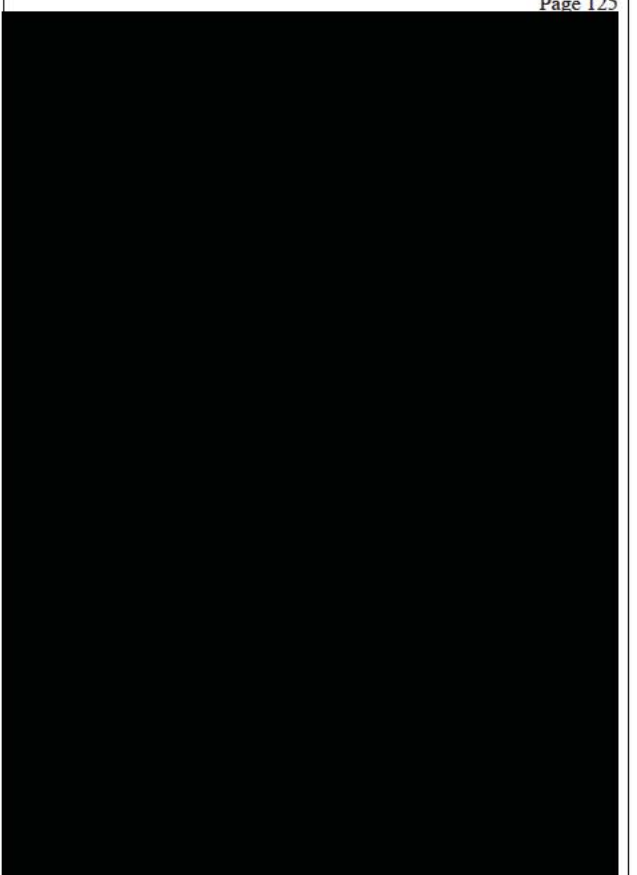


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<p style="text-align: right;">Page 118</p> <p>1 the specifics.</p> <p>2 Q. Do you know how many PEMS tests Mr.</p> <p>3 Wishart has done?</p> <p>4 A. I do not.</p> <p>5 Q. Do you have any sense of scale? Is</p> <p>6 it, you know, has he done five, ten, a</p> <p>7 thousand?</p> <p>8 A. I would say in the single to double</p> <p>9 digit range.</p> <p>10 Q. And what's your basis for giving me</p> <p>11 that estimate, if you have one?</p> <p>12 A. In talking to him about some of the</p> <p>13 prior work that he had at Intertek that's, you</p> <p>14 know, kind of an estimate from what I remember</p> <p>15 from those discussions and different programs</p> <p>16 he was on.</p> <p>17 Q. Did Mr. Wishart write any parts of</p> <p>18 the report that specifically discuss PEMS</p> <p>19 testing either by General Motors or by Mr.</p> <p>20 Smithers?</p> <p>21 MS. SMITH: Objection, form.</p> <p>22 THE WITNESS: I don't know</p> <p>23 if he drafted those sections. He might</p> <p>24 have provided input on those sections,</p> <p>25 but I don't remember. I can't remember</p>	<p style="text-align: right;">Page 120</p> <p>1 some other cases relating to Volkswagen, you</p> <p>2 have given testimony regarding PEMS tests and</p> <p>3 written reports regarding PEMS tests. Was Mr.</p> <p>4 Wishart also assisting you in those cases?</p> <p>5 A. I believe most of those reports</p> <p>6 were written prior to Dr. Wishart becoming an</p> <p>7 employee of Exponent. So I don't think he</p> <p>8 drafted any of it. There may have been some of</p> <p>9 the later reports that he was, when he was</p> <p>10 employed that I may have asked him to look at a</p> <p>11 few things, but I think most of the drafting</p> <p>12 was done prior to him coming on board.</p> <p>13 Q. Now, since you've never conducted a</p> <p>14 PEMS test yourself, are you relying on the</p> <p>15 experience of Mr. Wishart in order to</p> <p>16 substantiate your opinions regarding whether</p> <p>17 Mr. Smithers' PEMS tests were conducted</p> <p>18 appropriately?</p> <p>19 MS. SMITH: Objection, form.</p> <p>20 THE WITNESS: So I</p> <p>21 considered, you know, input from Dr.</p> <p>22 Wishart, but my analyses is based on</p> <p>23 other PEMS testing that I've looked at,</p> <p>24 documented papers about PEMS testing,</p> <p>25 information about West Virginia, how</p>
<p style="text-align: right;">Page 119</p> <p>1 exactly if he added to those sections</p> <p>2 about GM's PEMS testing or not.</p> <p>3 BY MR. WOJTANOWICZ:</p> <p>4 Q. Did Mr. Wishart summarize for you</p> <p>5 the procedures that he followed during the</p> <p>6 times that he was conducting PEMS testing?</p> <p>7 MS. SMITH: Objection, form.</p> <p>8 THE WITNESS: Again, I think</p> <p>9 we talked about this before. He and I</p> <p>10 had a verbal discussion, I don't know</p> <p>11 if he had a procedure that he drafted</p> <p>12 for that day. I can't remember.</p> <p>13 BY MR. WOJTANOWICZ:</p> <p>14 Q. Did Mr. Wishart identify for you</p> <p>15 any written protocols that he believes should</p> <p>16 govern the conducting of a PEMS test?</p> <p>17 MS. SMITH: Objection, form.</p> <p>18 THE WITNESS: Again, we</p> <p>19 weren't doing PEMS testing that day. I</p> <p>20 know we had talked about, you know,</p> <p>21 some of the stuff that was in the</p> <p>22 user's manual, but I don't remember a</p> <p>23 specific protocol that he had drafted.</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. You know, you testified that in</p>	<p style="text-align: right;">Page 121</p> <p>1 the EPA uses PEMS testing, and how the</p> <p>2 European Commission has used PEMS</p> <p>3 testing, so collectively, I considered</p> <p>4 all that information.</p> <p>5 BY MR. WOJTANOWICZ:</p> <p>6 Q. Okay. To the extent that you</p> <p>7 considered Mr. Wishart's input, you did that in</p> <p>8 the form of some verbal communications,</p> <p>9 correct?</p> <p>10 A. Verbal communications and then he</p> <p>11 assisted drafting the sections on some of the</p> <p>12 PEMS testing and the inspections -- on the</p> <p>13 inspection.</p> <p>14 Q. Okay. And so he communicated to</p> <p>15 you his input regarding the sufficiency of the</p> <p>16 PEMS testing described in your report by</p> <p>17 helping to draft some of the sections for you</p> <p>18 to consider whether that belonged in your</p> <p>19 report or not, correct?</p> <p>20 MS. SMITH: Objection, form.</p> <p>21 THE WITNESS: It was based</p> <p>22 on the conversations we had and, you</p> <p>23 know, my observations from what he had</p> <p>24 provided and then provided him some</p> <p>25 direction about what observations I had</p>



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<p style="text-align: right;">Page 122</p> <p>1 from his reporting on what was</p> <p>2 conducted at the scene during the</p> <p>3 testing -- or during the inspection and</p> <p>4 feedback that he had gleaned from</p> <p>5 looking at different PEMS testing</p> <p>6 protocols.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. Did you conduct any dynamometer</p> <p>9 tests on any Cruze diesel vehicles for the</p> <p>10 purposes of your analysis here?</p> <p>11 A. I did not.</p> <p>12 Q. Did anyone working under your</p> <p>13 direction perform any dynamometer tests on</p> <p>14 Cruze vehicles for this case?</p> <p>15 A. No, they did not.</p> <p>16 Q. Do you know -- are you aware of any</p> <p>17 third party or any dynamometer tests on Cruze</p> <p>18 vehicles being performed for purposes of this</p> <p>19 case other than any one that may have been</p> <p>20 performed by you or actually someone else at</p> <p>21 Exponent?</p> <p>22 MS. SMITH: Objection, form.</p> <p>23 THE WITNESS: Sorry, am I</p> <p>24 aware of anybody else who has done dyn</p> <p>25 testing?</p>	<p style="text-align: right;">Page 124</p> <p>1 can glean from the produced materials</p> <p>2 in Mr. Smithers' data.</p> 
<p style="text-align: right;">Page 123</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Correct, on the Cruze vehicles at</p> <p>3 issue here.</p> <p>4 A. I'm not aware of anybody at</p> <p>5 Exponent, obviously, Mr. Smithers did some dyno</p> <p>6 testing at TRC, but other than that, I'm not</p> <p>7 aware of any additional testing.</p> <p>8 Q. Did you consider conducting</p> <p>9 dynamometer testing on any Cruze vehicles for</p> <p>10 your analysis here?</p> <p>11 MS. SMITH: Objection, form.</p> <p>12 THE WITNESS: Not really.</p> <p>13 Again, you know, as I was getting into</p> <p>14 the analyses and understanding the</p> <p>15 allegations and the data that Mr.</p> <p>16 Smithers had provided and then looking</p> <p>17 at the time constraints initially, that</p> <p>18 there wasn't likely going to be time to</p> <p>19 do it, but the more I got into it, and</p> <p>20 I realized, you know, kind of the</p> <p>21 issues with Mr. Smithers' methodology,</p> <p>22 the vehicles he tested, I didn't see</p> <p>23 how the dyno testing would have added</p> <p>24 much more to the information than that</p> <p>25 already had and to the opinions that I</p>	<p style="text-align: right;">Page 125</p> 



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<p style="text-align: right;">Page 134</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. And I want to call your attention</p> <p>3 back to a statement that you made earlier and</p> <p>4 tell me if I'm summarizing this correctly. I</p> <p>5 believe that you said that in the testing data</p> <p>6 that you received from -- regarding Mr.</p> <p>7 Smithers' PEMS tests that you do not have zero</p> <p>8 and span data for the test segments that he</p> <p>9 ran. Was that what you testified?</p> <p>10 A. His report didn't mention how he</p> <p>11 did his calibration data, was it on span gas</p> <p>12 data. There was some information in the Excel</p> <p>13 files. Some of it was missing. Some of it was</p> <p>14 there. We tried to understand that, but we</p> <p>15 couldn't come up with anything conclusive, but</p> <p>16 my statement was related to what was defined in</p> <p>17 his report.</p> <p>18 Q. So you're aware his report did</p> <p>19 indicate that they regularly calibrated the</p> <p>20 PEMS equipment during the course of their</p> <p>21 testing campaign. Do you recall that?</p> <p>22 A. He mentioned that he calibrated it,</p> <p>23 but didn't expand on what was done.</p> <p>24 Q. And the test data files that were</p> <p>25 provided to you by counsel for General Motors,</p>	<p style="text-align: right;">Page 136</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Going back, we were discussing your</p> <p>3 background, if any, in computer programming,</p> <p>4 computer science, kind of when we went to break</p> <p>5 there, so let me just ask you again, you don't</p> <p>6 have any degrees in computer programming or</p> <p>7 computer science, do you?</p> <p>8 A. I do not have degrees in those</p> <p>9 areas.</p> <p>10 Q. Have you had any training in</p> <p>11 computer science or computer programming?</p> <p>12 A. As part of my undergraduate and</p> <p>13 graduate study, we had to do computer</p> <p>14 programming. And in my graduate program, we</p> <p>15 had to look at engine controls and evaluate</p> <p>16 vehicles on dynos and look at engine controls</p> <p>17 and how sensor inputs were used for vehicle</p> <p>18 control.</p> <p>19 Q. So is it fair to say that the</p> <p>20 computer science or computer programming</p> <p>21 classes you had as an undergraduate were sort</p> <p>22 of supplemental to or in conjunction with your</p> <p>23 general engineering classwork, it wasn't a</p> <p>24 specified emphasis in computer science?</p> <p>25 A. So, yeah, I don't have a degree in</p>
<p style="text-align: right;">Page 135</p> <p>1 those included data using the zero and span</p> <p>2 testing for every test segment, didn't it?</p> <p>3 A. There was some missing data in one</p> <p>4 of the cells and I can't recall exactly, but</p> <p>5 there was some information in some of the other</p> <p>6 cells about zero and span gas, but we couldn't</p> <p>7 conclusively determine what was done there,</p> <p>8 because there was a missing cell or some -- I</p> <p>9 can't remember, there was a note about zero</p> <p>10 span gas not used, but then in another spot, it</p> <p>11 was there, so we weren't able to conclusively</p> <p>12 determine if he used it or not, but there was</p> <p>13 some information in there.</p> <p>14 Q. So it's not your testimony, is it,</p> <p>15 that Mr. Smithers failed to conduct zero and</p> <p>16 span testing or calibrations on the PEMS units,</p> <p>17 that's not what you're testifying to?</p> <p>18 MS. SMITH: Objection, form.</p> <p>19 THE WITNESS: I'm not</p> <p>20 testifying that he didn't do it, I just</p> <p>21 couldn't confirm it and what was in the</p> <p>22 report didn't provide any insight, so</p> <p>23 we were left with trying to figure and</p> <p>24 interpret the data in there.</p> <p>25</p>	<p style="text-align: right;">Page 137</p> <p>1 computer science. My work in computer science</p> <p>2 is related to the vehicle level control and</p> <p>3 some of my work with calibrations and then</p> <p>4 loading calibrations on vehicles, and the</p> <p>5 applied use of control theory for mechanical</p> <p>6 and engine controls.</p> <p>7 Q. Did you personally -- did you</p> <p>8 examine the software coding for the EDC or</p> <p>9 electronic diesel control in the Cruze</p> <p>10 vehicles?</p> <p>11 A. I'm sorry, I missed that first</p> <p>12 part.</p> <p>13 Q. Software code for the EDC.</p> <p>14 A. I examined some parts of it and</p> <p>15 then I examined Dr. Levchenko's report.</p> <p>16 Q. Did you have someone at Exponent or</p> <p>17 elsewhere examine the computer code for you?</p> <p>18 A. So Dave Anderson and Matt Pooley</p> <p>19 had looked into that and looked at Dr.</p> <p>20 Levchenko's analysis of some of that code.</p> <p>21 Q. So you said earlier that Matt</p> <p>22 Pooley is an Exponent employee, he has a Ph.D</p> <p>23 in engineering and computer science or</p> <p>24 something to that effect; is that a fair</p> <p>25 summary?</p>



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<p style="text-align: right;">Page 138</p> <p>1 MS. SMITH: Objection, form.</p> <p>2 THE WITNESS: Yes, that's my</p> <p>3 recollection.</p> <p>4 BY MR. WOJTANOWICZ:</p> <p>5 Q. What about David Anderson, is he</p> <p>6 also a computer scientist?</p> <p>7 A. I believe he's a mechanical</p> <p>8 engineer that spent quite a bit a time with</p> <p>9 controls for engines and after-treatment</p> <p>10 systems.</p> <p>11 Q. So is it fair to say that Dave</p> <p>12 Anderson and Matt Pooley performed the direct</p> <p>13 analysis of the software code at your</p> <p>14 direction?</p> <p>15 A. At my direction and with my input,</p> <p>16 we reviewed it. They did some deeper dives</p> <p>17 when I asked for some additional information to</p> <p>18 be gleaned from Dr. Levchenko's report.</p> <p>19 Q. And how did they convey from what</p> <p>20 they learned to you? Was it oral? Was it in</p> <p>21 writing?</p> <p>22 A. It was oral and then it was the</p> <p>23 drafting of the text in those areas. So I</p> <p>24 would talk to them about their findings and</p> <p>25 then they drafted it up or drafted up the</p>	<p style="text-align: right;">Page 140</p> <p>1 Exhibit 1, which is the copy of your report.</p> <p>2 And I will go through some of the items in your</p> <p>3 CV, which is at Appendix A following the body</p> <p>4 of your report.</p> <p>5 A. Okay. I'm there.</p> <p>6 Q. Okay. First of all, is your CV, is</p> <p>7 this the most up-to-date version of the CV that</p> <p>8 you have?</p> <p>9 A. Yes, this is the most up-to-date</p> <p>10 one.</p> <p>11 Q. And is everything accurate in here</p> <p>12 to the best of your knowledge?</p> <p>13 A. Yes.</p> <p>14 Q. I would like to go through your</p> <p>15 prior work experience. You've been with</p> <p>16 Exponent since 2017; is that correct?</p> <p>17 A. That is correct.</p> <p>18 Q. Describe for me in general what you</p> <p>19 primarily do at Exponent.</p> <p>20 A. So I'm a principal at Exponent. My</p> <p>21 role is to work with clients, understand their</p> <p>22 needs, develop new work, whether it be, you</p> <p>23 know, kind of consulting work or expert</p> <p>24 testimony. So my work is really, you know,</p> <p>25 working with clients and helping understand how</p>
<p style="text-align: right;">Page 139</p> <p>1 observations for the report.</p> <p>2 Q. Did they summarize their findings</p> <p>3 for you in any way other than putting it in a</p> <p>4 draft report?</p> <p>5 A. My recollection is it was all done</p> <p>6 in the report.</p> <p>7 Q. Because you didn't do the direct</p> <p>8 analysis of the software code yourself in its</p> <p>9 entirety, you had to rely on their analysis in</p> <p>10 your consideration of the software issues</p> <p>11 mentioned in your report; is that true?</p> <p>12 MS. SMITH: Objection --</p> <p>13 THE WITNESS: So it was --</p> <p>14 sorry, go ahead, Renee.</p> <p>15 MS. SMITH: Just objection,</p> <p>16 form.</p> <p>17 THE WITNESS: So it was at</p> <p>18 my direction and with my input. I did</p> <p>19 rely on some of their findings and then</p> <p>20 reevaluated what they had done and</p> <p>21 walked through the findings with them</p> <p>22 and did some of my own review of Dr.</p> <p>23 Levchenko's report.</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. So I would like you to turn back to</p>	<p style="text-align: right;">Page 141</p> <p>1 I might be able to help them from a consulting</p> <p>2 perspective in areas of vehicle engineering,</p> <p>3 whether it's engines and controls, advanced</p> <p>4 driver-assistance systems, automated vehicles,</p> <p>5 government regulations.</p> <p>6 Q. What percentage of your work would</p> <p>7 you say since you joined Exponent relates to</p> <p>8 providing expert testimony or expert consulting</p> <p>9 services, whether or not it leads to the</p> <p>10 generation of a report or not?</p> <p>11 A. I would say kind of over the</p> <p>12 three-plus years, something around kind of</p> <p>13 50/50. Fifty percent in consulting, 50 percent</p> <p>14 expert witness.</p> <p>15 Q. With respect to your consulting</p> <p>16 work, what percentage of your consulting work</p> <p>17 relates to vehicle, diesel vehicle emissions?</p> <p>18 A. So specifically diesel vehicles, on</p> <p>19 the consulting side, I can't think of any work</p> <p>20 in that area.</p> <p>21 Q. Do you do any -- then what</p> <p>22 percentage of your consulting work relates to</p> <p>23 gasoline vehicle emissions?</p> <p>24 A. I'm sorry, I missed it, was it on</p> <p>25 the consulting side or the expert testimony</p>



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<p style="text-align: right;">Page 142</p> <p>1 side?</p> <p>2 Q. On the consulting side.</p> <p>3 A. So of that 50 percent, I would say</p> <p>4 a third to half of that relates to gasoline</p> <p>5 vehicles, engines.</p> <p>6 Q. No, I'm specifically asking</p> <p>7 regarding gasoline vehicles, and maybe you said</p> <p>8 this and I misheard you, gasoline vehicle</p> <p>9 emissions.</p> <p>10 A. Oh, sorry. On the emissions side,</p> <p>11 there's some attributes of what I do that's</p> <p>12 related to emissions, it's not the primary</p> <p>13 piece, so I would say a smaller fraction of</p> <p>14 that 50 percent is related to gasoline vehicle</p> <p>15 emissions.</p> <p>16 Q. And is that because a portion of</p> <p>17 your work relates to fuel economy and there is</p> <p>18 some cross, sort of some relationship between</p> <p>19 fuel economy and emissions?</p> <p>20 A. Yeah, and a gasoline engine</p> <p>21 performance kind of in general, yes.</p> <p>22 Q. So while some of your consulting</p> <p>23 work may bear on issues that relate to</p> <p>24 emissions, none of it really is focused</p> <p>25 specifically on measuring or controlling</p>	<p style="text-align: right;">Page 144</p> <p>1 A. They would be more in the tech</p> <p>2 sector, I would call it.</p> <p>3 Q. Are these generally companies who</p> <p>4 might manufacture components for vehicles, but</p> <p>5 not an entire vehicle?</p> <p>6 A. I would say that's a fair</p> <p>7 generalization.</p> <p>8 Q. Is it fair to say that they're all</p> <p>9 related to the automobile industry, even if</p> <p>10 they're not manufacturers, per se?</p> <p>11 MS. SMITH: Object to form.</p> <p>12 THE WITNESS: I would have</p> <p>13 to go back and look for sure to see if</p> <p>14 I'm missing something, but I think</p> <p>15 that's a correct assessment.</p> <p>16 BY MR. WOJTANOWICZ:</p> <p>17 Q. And of the roughly 50 percent of</p> <p>18 your work at Exponent that has been related to</p> <p>19 litigation-related work, what percentage of</p> <p>20 that litigation-related work relates to diesel</p> <p>21 vehicle emissions?</p> <p>22 A. I would say, like, a third to maybe</p> <p>23 half, somewhere in there, it's kind of, it's</p> <p>24 hard to say because it fluctuates, but I would</p> <p>25 say a third to half is related to diesel</p>
<p style="text-align: right;">Page 143</p> <p>1 emissions in gasoline vehicles; is that a fair</p> <p>2 statement?</p> <p>3 A. I think that's a fair statement.</p> <p>4 Q. So does that kind of -- and to the</p> <p>5 extent that we haven't -- what are the subject</p> <p>6 matters that make up the bulk of your</p> <p>7 consulting work at Exponent since you have been</p> <p>8 there?</p> <p>9 A. So kind of fuel economy, government</p> <p>10 regulatory analyses, engine failures, recalls,</p> <p>11 and consulting related to advanced</p> <p>12 driver-assisted systems or automated vehicles.</p> <p>13 Q. And what percentage of your</p> <p>14 consulting work is done for automobile</p> <p>15 manufacturers, if you can generalize?</p> <p>16 A. I would say of that consulting</p> <p>17 work, 75 percent is for automotive</p> <p>18 manufacturers.</p> <p>19 Q. Is GM among the companies that has</p> <p>20 retained you for consulting work?</p> <p>21 A. No.</p> <p>22 Q. The 25 percent that remains of the</p> <p>23 consulting work that is for somebody other than</p> <p>24 auto manufacturers, what kind of companies are</p> <p>25 those, if you can summarize for me?</p>	<p style="text-align: right;">Page 145</p> <p>1 emissions.</p> <p>2 Q. And what percentage relates to fuel</p> <p>3 economy issues, if any?</p> <p>4 A. I would say 10, 15 percent,</p> <p>5 somewhere in there.</p> <p>6 Q. And is there -- can you summarize</p> <p>7 for me what the remaining, you know, whatever</p> <p>8 35 to 40 or 50 percent of your time spent on</p> <p>9 litigation-related matters, what the subject</p> <p>10 matters are?</p> <p>11 A. Yeah, so it would be failures of</p> <p>12 components in gasoline engines, failure to</p> <p>13 recalls related to transmissions, then kind of</p> <p>14 broadly some of the more emerging technologies,</p> <p>15 like advanced driver-assistance systems</p> <p>16 vehicles or automated vehicles.</p> <p>17 Q. Is it fair to say that all of the</p> <p>18 work that you've done on the litigation side is</p> <p>19 representing defendants in automobile-related</p> <p>20 litigation?</p> <p>21 MS. SMITH: Objection, form.</p> <p>22 THE WITNESS: To date, it</p> <p>23 has been on the defense side, yes.</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. The diesel emissions-related work</p>

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<p style="text-align: right;">Page 158</p> <p>1 worse than the fuel economy listed. There was  2 an offset, I think, around 10 percent that on  3 average, even though EPA and DOT got closer, it  4 wasn't always a perfect match that there was  5 typically a 10 percent offset and that was due  6 to things like wind resistance, maintenance on  7 the vehicle that couldn't be captured  8 completely on cycle.  9 Q. During the course of your analysis  10 of the dynamometer testing results submitted in  11 connection with your work on the CAFE  12 standards, did you ever identify any  13 dynamometer testing results submitted by an OEM  14 that you believed were false or inaccurate?  15 MS. SMITH: Objection, form.  16 THE WITNESS: No.  17 Typically, the data I saw was at a  18 higher kind of aggregate level and I  19 didn't see anything where there was --  20 you know, it was more at the aggregate  21 level.  22 BY MR. WOJTANOWICZ:  23 Q. Did you do an analysis to determine  24 why there historically had been a significant  25 difference between the reported fuel economy</p>	<p style="text-align: right;">Page 160</p> <p>1 factor needed to be corrected or  2 adjusted.  3 BY MR. WOJTANOWICZ:  4 Q. Okay. It sounds like you were  5 describing to me what the EPA had done to  6 analyze those factors, but I'm asking whether  7 you specifically conducted any analyses related  8 to identifying the reason for the discrepancy  9 between dynamometer testing results and  10 real-world results relating to CAFE standards?  11 MS. SMITH: Objection, form.  12 THE WITNESS: So my work was  13 with the EPA, I didn't conduct specific  14 testings or specific analyses at that  15 point trying to pinpoint the exact  16 differences, no.  17 BY MR. WOJTANOWICZ:  18 Q. Okay. Did you at any point?  19 A. I think I worked with our economist  20 who looked at kind of -- it has been a long  21 time since I've had to think about this or do  22 anything with it. There was some, like,  23 household survey studies that had information  24 about fuel economy that we had to look at as it  25 related to some of the work the EPA had done,</p>
<p style="text-align: right;">Page 159</p> <p>1 for purposes of compliance with CAFE standards  2 and the actual on-road fuel economy experienced  3 by consumers?  4 A. You said -- I guess if you could  5 read the question back, the first part, the  6 specific nature of it.  7 MR. WOJTANOWICZ: Sure.  8 Would the reporter please read it back?  9 -----  10 (Whereupon, the reporter read back  11 as requested.)  12 -----  13 THE WITNESS: So, again,  14 that was at the higher level of looking  15 at what were some of the conditions  16 that were outside of the test procedure  17 that could be -- could influence fuel  18 economy in the real world, so there was  19 some, you know, kind of the broader  20 studies about environmental conditions,  21 hills, and things like that. There  22 wasn't a deep dive into the specific  23 aspects. The EPA had done quite a bit  24 of that over time and there was kind of  25 an analysis of if that adjustment</p>	<p style="text-align: right;">Page 161</p> <p>1 but I can't remember the specifics offhand.  2 Q. In your position as senior engineer  3 at the Department of Transportation, did you  4 have any responsibility for on-road testing to  5 assess the real-world performance of fuel  6 economy for vehicles?  7 MS. SMITH: Objection, form.  8 THE WITNESS: Actual vehicle  9 testing, no. I had led some work with  10 Argonne National Labs who was doing  11 some simulation work on -- you know,  12 part of the reason it's hard to  13 evaluate technology is that they don't  14 exist, so there isn't dyno work or  15 on-road data, so the DOT contracted  16 with Argonne National Labs to do some  17 testing and some of that was testing  18 for on-cycle testing, but there was  19 some testing about kind of off-cycle  20 testing as well to understand where  21 there might be differences or gaps. So  22 I would have led and informed some of  23 that work, but that was in simulation,  24 not physical vehicle testing.  25</p>



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<p style="text-align: right;">Page 178</p> <p>1 MR. WOJTANOWICZ: I was just 2 about to suggest that we take our lunch 3 break now, so. 4 MS. SMITH: Perfect, and 5 could you stay on for one second after 6 we go off the record to just discuss 7 some general scheduling? 8 MR. WOJTANOWICZ: Is that to 9 me or to -- 10 MS. SMITH: To everyone, 11 sorry. 12 THE VIDEOGRAPHER: The time 13 is 2:09. We're off the record. 14 ----- 15 (A recess was taken at this time.) 16 ----- 17 THE VIDEOGRAPHER: The time 18 is 2:53. We are on the record. 19 BY MR. WOJTANOWICZ: 20 Q. All right. Mr. Harrington, a few 21 more questions about your CV here. Next, I 22 wanted to ask you about your publications, 23 there are quite a few of them listed there. I 24 don't want to belabor this by going through 25 each of them. Can you tell me whether any of</p>	<p style="text-align: right;">Page 180</p> <p>1 publications, correct? 2 Q. You know you're right, I slid over 3 into presentations. I apologize. 4 A. No worries. 5 Q. Okay. Yeah. So the first one of 6 those that you referenced, that is -- it says 7 "Corporate Average Fuel Economy Compliance and 8 Effects Modeling System Documentation." Can 9 you describe for me what that publication is? 10 A. Sure. The work that I did on fuel 11 economy standards, in order for the DOT and 12 EPA to -- or the DOT specifically to promulgate 13 fuel economy regulations, it has to evaluate 14 the feasibility of technologies and the fuel 15 economy standards. So, again, as I mentioned, 16 my role was to look at the assumptions related 17 to emerging fuel saving and CO2 reducing 18 technologies and so that documentation was a 19 separate piece of all the regulatory documents 20 that I helped write, but I wasn't a named 21 author, because they're federal documents, but 22 that report was how the modeling system worked, 23 the assumptions that were in it, and a lot of 24 the assessments that I had made were documented 25 in that document as they relate to gasoline and</p>
<p style="text-align: right;">Page 179</p> <p>1 these publications relate to emissions testing 2 for diesel vehicles? 3 A. So the third from the bottom, the 4 Corporate Average Fuel Economy effects 5 modeling, so that deals with gasoline and 6 diesel vehicle, fuel economy and CO2 emissions. 7 It's not specific to diesel vehicle emissions 8 testing, but it relates to diesel vehicle, CO2 9 and fuel economy performance. And the same 10 with the one just above it the "Corporate 11 Average Fuel Economy Effects and Modeling 12 System Documentation." 13 THE STENOGRAPHER: Can you 14 slow down a little bit when you're 15 reading, please? 16 THE WITNESS: I'm sorry. So 17 there's two that are related to fuel 18 economy and CO2 emissions from gasoline 19 and diesel vehicles. It would be the 20 third from the bottom and the fourth 21 from the bottom in my list. 22 BY MR. WOJTANOWICZ: 23 Q. Those are on page 4 of the last 24 page of your CV? 25 A. It's page 3. You said</p>	<p style="text-align: right;">Page 181</p> <p>1 diesel vehicle fuel economy and CO2 emissions 2 and related technologies. 3 Q. But that publication did not 4 address the proper way to conduct PEMS testing, 5 did it? 6 A. There was not a discussion of PEMS 7 testing that I can recall in that document. 8 Q. And that publication did not 9 discuss the proper way to conduct dynamometer 10 testing for emissions testing, did it? 11 A. Not that I recall. 12 Q. Did that publication address the 13 proper way to -- the proper way to evaluate 14 data relating to emissions testing? 15 MS. SMITH: Objection, form. 16 THE WITNESS: I believe that 17 had some discussion of the on-road 18 adjustment as it relates to fuel 19 economy standards, if I recall 20 correctly. 21 BY MR. WOJTANOWICZ: 22 Q. What's the on-road adjustment as it 23 relates to fuel economy -- 24 A. So from the difference between a 25 test cycle and kind of the average on-road fuel</p>



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<p style="text-align: right;">Page 182</p> <p>1 economy, that delta between what was tested and</p> <p>2 versus kind of the average on-road fuel economy</p> <p>3 performance of vehicles out in the fleet.</p> <p>4 Q. And then the next stated</p> <p>5 publication, it looks like it has essentially</p> <p>6 the same title "Corporate Average Fuel Economy</p> <p>7 Compliance and Effects Modeling System</p> <p>8 Documentation." Was that publication related</p> <p>9 to the prior one that we just discussed?</p> <p>10 A. So they're, in essence, you know,</p> <p>11 the same or similar document, the one you just</p> <p>12 mentioned was for the 2012 through 2016 model</p> <p>13 year rule and the first one that you had stated</p> <p>14 was the 2017 to 2025 model year rule, so the</p> <p>15 same document, but for two different documents</p> <p>16 rule makings and time periods.</p> <p>17 Q. What was your role in -- and there</p> <p>18 was some coauthors that you had with both of</p> <p>19 those publications, correct?</p> <p>20 A. Correct.</p> <p>21 Q. What was your role with respect to</p> <p>22 drafting those publications?</p> <p>23 A. So I drafted the sections that were</p> <p>24 related to the technology assumptions that went</p> <p>25 into the model and how we addressed the fleet</p>	<p style="text-align: right;">Page 184</p> <p>1 you spoken where you weren't invited to speak?</p> <p>2 A. I can't recall which ones I</p> <p>3 wasn't -- usually, I'm invited to speak. I</p> <p>4 think there was a few where I offered to speak,</p> <p>5 but typically, I get invited to speak at</p> <p>6 different conferences or different topic areas.</p> <p>7 Q. Are any of the -- do you know</p> <p>8 whether any of the presentations that you have</p> <p>9 not listed where you offered to speak, did any</p> <p>10 of them relate to diesel vehicle emissions?</p> <p>11 A. I guess the presentations that</p> <p>12 might not have been on there, when I was at</p> <p>13 Cummins, I think I mentioned this before, I had</p> <p>14 to go out and work with fleets about upcoming</p> <p>15 changes to the vehicles due to regulations, so</p> <p>16 I had to present on those topics to some of our</p> <p>17 clients and customers. So those probably were</p> <p>18 not listed on here, talking to some fleets or</p> <p>19 potential customers of Cummins engines, so that</p> <p>20 related to heavy-duty vehicles and engines.</p> <p>21 Q. Any other presentations that are</p> <p>22 not listed here that relate to diesel vehicle</p> <p>23 emissions?</p> <p>24 A. Internally to the DOT and EPA, I</p> <p>25 gave quite a few presentations to senior</p>
<p style="text-align: right;">Page 183</p> <p>1 of vehicles that were used to model an overall</p> <p>2 fleet of vehicles going forward.</p> <p>3 Q. Any other parts that you drafted?</p> <p>4 A. It has been a while since I looked</p> <p>5 at those. Those are the two main parts that I</p> <p>6 would have been responsible for. I might have</p> <p>7 provided input to some other sections, but I</p> <p>8 can't think of them right now.</p> <p>9 Q. And other than those two that you</p> <p>10 just identified, none of the other publications</p> <p>11 listed here relate to emissions compliance</p> <p>12 testing in any way, correct?</p> <p>13 A. That is correct.</p> <p>14 Q. Your CV also lists a number of</p> <p>15 presentations. It says "Selected Invited</p> <p>16 Presentations," does that mean you've given</p> <p>17 more presentations than the ones that you have</p> <p>18 listed here?</p> <p>19 A. Yeah, there was some other -- where</p> <p>20 I wasn't invited to speak, it was kind of</p> <p>21 lesser roles, and I couldn't remember all of</p> <p>22 them, so these are the main ones where I was</p> <p>23 selected and invited to speak on a particular</p> <p>24 topic.</p> <p>25 Q. And what sorts of occasions have</p>	<p style="text-align: right;">Page 185</p> <p>1 officials, White House staff, as relates to</p> <p>2 fuel economy standards and greenhouse gas</p> <p>3 emissions, which include diesel vehicles and</p> <p>4 technology. And it looks like the National</p> <p>5 Academy of Sciences Committee Meeting is on</p> <p>6 here, so that one is actually listed that's the</p> <p>7 third from the bottom under presentations.</p> <p>8 Q. Okay. Have you given any</p> <p>9 presentations that relate to any diesel vehicle</p> <p>10 emissions cheating allegations?</p> <p>11 A. No.</p> <p>12 Q. Have you given any presentations</p> <p>13 that relate to PEMS testing or how to conduct</p> <p>14 PEMS testing?</p> <p>15 A. Not that I can recall.</p> <p>16 Q. Have you given any presentations</p> <p>17 regarding the proper way to conduct a</p> <p>18 dynamometer testing?</p> <p>19 A. Not that I can recall, no.</p> <p>20 Q. There's a presentation listed at</p> <p>21 the bottom of page 3 of your CV, the very</p> <p>22 bottom is where it starts "The Future of</p> <p>23 Vehicle Fuel Efficiency &amp; Emissions Policies."</p> <p>24 It says you were a panelist at a meeting of</p> <p>25 Motor &amp; Equipment Manufacturers Association.</p>



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<p style="text-align: right;">Page 306</p> <p>1 well.</p> <p>2 Q. There's also some time components</p> <p>3 there that you need to have achieved a</p> <p>4 prescribed speed within a certain period of</p> <p>5 time, like a deadline within the testing</p> <p>6 period; is that right?</p> <p>7 A. So it's part of that plus or minus</p> <p>8 2-mile-an-hour curve, yeah, you have to follow,</p> <p>9 you have to follow that trace and if you,</p> <p>10 obviously, are lagging or ahead in speed, you</p> <p>11 won't complete the test in the right time</p> <p>12 period.</p> <p>13 Q. So there's some leeway for a driver</p> <p>14 to have an influence on the outcome of an</p> <p>15 emissions test on a dynamometer by either being</p> <p>16 a little bit higher or a little bit lower on</p> <p>17 speed and a little bit earlier or a little bit</p> <p>18 late on time, as long as they can stay within</p> <p>19 the acceptable parameters, correct?</p> <p>20 MS. SMITH: Objection, form.</p> <p>21 THE WITNESS: There is some,</p> <p>22 just like there is vehicle-to-vehicle</p> <p>23 variation, there's some</p> <p>24 driver-to-driver variation, but the way</p> <p>25 the regulations and the tests are</p>	<p style="text-align: right;">Page 308</p> <p>1 referring to a specific page of this or</p> <p>2 are you just asking him that?</p> <p>3 MR. WOJTANOWICZ: I'm just</p> <p>4 asking him.</p> <p>5 MS. SMITH: Okay. Are you</p> <p>6 sure you're saying it right?</p> <p>7 THE WITNESS: Is there a --</p> <p>8 I'm not remembering seeing something</p> <p>9 like that, but I'm not sure. Is there</p> <p>10 a document that that's in?</p> <p>11 BY MR. WOJTANOWICZ:</p> <p>12 Q. No, I'm asking if you are familiar</p> <p>13 with that calculation, apparently, the answer</p> <p>14 to that is no. You're not familiar with the VA</p> <p>15 POS at 95 calculation?</p> <p>16 MS. SMITH: Objection, form.</p> <p>17 Objection, you are not showing the</p> <p>18 document. I'm not sure the way you're</p> <p>19 even describing the signs is something</p> <p>20 that's comprehensible. So objection.</p> <p>21 THE WITNESS: There's the</p> <p>22 relative positive -- is it relative</p> <p>23 positive acceleration that you are</p> <p>24 talking about? Hearing what you said,</p> <p>25 I don't remember seeing that, that</p>
<p style="text-align: right;">Page 307</p> <p>1 written, it tries to minimize that to a</p> <p>2 quantity that's not, you know, overly</p> <p>3 influential in the overall results, but</p> <p>4 there is some variability there.</p> <p>5 BY MR. WOJTANOWICZ:</p> <p>6 Q. And what kind of analysis of driver</p> <p>7 aggressiveness did you do for purposes of</p> <p>8 determining whether you could rely on these CoC</p> <p>9 tests and figures here?</p> <p>10 MS. SMITH: Objection, form.</p> <p>11 Objection, misstates what his opinions</p> <p>12 are.</p> <p>13 THE WITNESS: So I don't</p> <p>14 remember doing any analyses and I don't</p> <p>15 remember seeing data on that.</p> <p>16 BY MR. WOJTANOWICZ:</p> <p>17 Q. Did you calculate -- do you know</p> <p>18 what V times A underscore POS at 95 refers to?</p> <p>19 A. Can you repeat that again?</p> <p>20 Q. Sure. There's a sort of, I guess</p> <p>21 it's a calculation called the VA POS at 95,</p> <p>22 which is representative of the V times A</p> <p>23 underscore P-O-S or POS and the at sign, 95,</p> <p>24 are you familiar with that measurement?</p> <p>25 MS. SMITH: Are you</p>	<p style="text-align: right;">Page 309</p> <p>1 metric or that number or equation that</p> <p>2 you're referencing.</p> <p>3 BY MR. WOJTANOWICZ:</p> <p>4 Q. Relative positive acceleration is</p> <p>5 something else, let me ask you this, did you</p> <p>6 calculate the relative positive acceleration</p> <p>7 for the CoC test results presented here?</p> <p>8 A. I don't remember calculating that,</p> <p>9 no.</p> <p>10 Q. Okay. The VA POS at 95 measurement</p> <p>11 is defined sometimes as the 95th percentile of</p> <p>12 the products of instantaneous speed and</p> <p>13 positive acceleration. Does that ring any</p> <p>14 bells?</p> <p>15 MS. SMITH: Objection, form.</p> <p>16 THE WITNESS: It does not.</p> <p>17 BY MR. WOJTANOWICZ:</p> <p>18 Q. Okay. It's safe to say then you</p> <p>19 did not conduct that particular calculation on</p> <p>20 the testing data relating to this CoC testing</p> <p>21 that you cite in your report?</p> <p>22 A. Looking at the 95th percentile,</p> <p>23 looking at the confidence interval, no, I did</p> <p>24 not calculate that for these runs.</p> <p>25 Q. So you didn't believe for purposes</p>

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UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF MICHIGAN

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JASON COUNTS, DONALD KLEIN, C.A. NO.  
OSCAR ZANORA, DEREK LONG, 1:16-CV-12541-TLL-PTM  
HASSAM HIRMIZ, JASON SILVEUS,  
JOHN MISKELLY, THOMAS HAYDUK,  
CHRISTOPHER HEMBERGER and  
JOSHUA RODRIGUEZ, individually  
and on behalf of all others similarly  
situated,

Plaintiffs,

-against-

GENERAL MOTORS LLC, ROBERT  
BOSCH GMBH, and ROBERT  
BOSCH, LLC,  
Defendants.

- - - - -

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- - - - -

VIRTUAL VIDEOTAPED DEPOSITION OF RYAN HARRINGTON  
NATICK, MASSACHUSETTS  
Thursday, July 23, 2020

VOLUME 2

REPORTED BY:  
ROBIN CLARK, RPR, CLR



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<p style="text-align: right;">Page 320</p> <p>1 Virtual Videotaped Deposition of RYAN  2 HARRINGTON, taken by Plaintiffs, pursuant to notice,  3 commencing at 10:12 a m., by and before Robin L.  4 Clark, Registered Professional Reporter and Notary  5 Public in and for the Commonwealth of Pennsylvania.  6 -----  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25</p>	<p style="text-align: right;">Page 322</p> <p>1 REMOTE APPEARANCES, continued:  2  3 CLEARY GOTTLIEB STEEN &amp; HAMILTON, LLP  4 BY: DAVID BRODSKY, ESQ  5 PATRICK SWIBER, ESQ  6 RENEE GRIFFIN, ESQ  7 2000 Pennsylvania Avenue, N W  8 Washington, D C 20006  9 202-947-1588  10 dbrodsky@cgsh.com  11 pswiber@cgsh.com  12 rgriffin@cgsh.com  13 For the Defendant Robert Bosch  14 LLC  15  16 ALSO PRESENT REMOTELY:  17  18 STEVEN HURVITZ, ESQ  19  20 HOWARD BRODSKY, VIDEOGRAPHER  21  22 JUSTON SMITHERS  23  24 ALI KRAL, TECHNICIAN  25 -----  26  27  28  29  30  31  32  33  34  35</p>
<p style="text-align: right;">Page 321</p> <p>1 REMOTE APPEARANCES:  2  3 HAGENS BERMAN SOBOL SHAPIRO, LLP  4 BY: GARTH WOJTANOWICZ, ESQ  5 STEVE BERMAN, ESQ  6 JESSICA THOMPSON, ESQ  7 1301 Second Avenue, Suite 2000  8 Seattle, Washington 98101  9 206-623-7292  10 garthw@hbsslaw.com  11 sberman@hbsslaw.com  12 jthompson@hbsslaw.com  13 For the Plaintiffs  14  15 CARELLA, BYRNE, CECCHI, OLSTEIN, BRODY &amp;  16 AGNELLO, P C  17 BY: JAMES E CECCHI, ESQ  18 ZACHARY BOWER, ESQ  19 5 Becker Farm Road  20 Roseland, New Jersey 07068  21 973-997-1700  22 jcecchi@carellabyrne.com  23 zbower@carellabyrne.com  24 For the Plaintiffs  25  26 SEEGER WEISS, LLP  27 BY: SHAUNA ITRI, ESQ  28 1515 Market Street, Suite 1380  29 Philadelphia, Pennsylvania 19102  30 215-564-2300  31 sitri@seegerweiss.com  32 For the Plaintiffs  33  34 KIRKLAND &amp; ELLIS, LLP  35 BY: RENEE D SMITH, ESQ  36 KATE WARNER, ESQ  37 300 North LaSalle  38 Chicago, Illinois 60654  39 312-862-2000  40 rdsmith@kirkland.com  41 kate.warner@kirkland.com  42 For the Defendant General  43 Motors LLC  44  45</p>	<p style="text-align: right;">Page 323</p> <p>1 I N D E X  2 WITNESS PAGE  3 RYAN HARRINGTON  4 BY MR WOJTANOWICZ: 327, 676  5 BY MS SMITH: 649  6  7 E X H I B I T S  8 NUMBER DESCRIPTION MARKED  9 Harrington  10 Exhibit 5 Dyno HP Coefficient 333  11 Determination Bates  12 GMCOUNTS000852163 to 852211  13 Exhibit 6 Privately-Owned Vehicle 341  14 Work Order Bates  15 GMCOUNTS000852050  16 Exhibit 7 Privately-Owned Vehicle 346  17 Work Order Bates  18 GMCOUNTS000851986 to 851987  19 Exhibit 8 Driver's Checklist Bates 346  20 GMCOUNTS000852149 to 852150  21  22 Exhibit 9 Calculator Document Bates 362  23 GMCOUNTS000852229  24 Exhibit 10 HWFET Chart 373  25 Exhibit 11 Email dated 5/16/19 Bates 400  26 GMCOUNTS000852424  27  28 Exhibit 12 Email String Bates 407  29 GMCOUNTS000852421 TO 852422  30 Exhibit 13 07_GM Diesel PEMS 428  31 Evaluation - MY14 Cruze  32 Bates GMCOUNTS000379567 to  33 379574  34  35 Exhibit 14 Deposition of Sarah Funk 449  36  37 Exhibit 15 Chevrolet Cruze Diesel 467</p>

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<p>1 the HWFET test results for these in-use testing 2 vehicles?</p> <p>3 A. I don't remember analyzing those. 4 I think the focus was just on the FTP.</p> <p>5 Q. Okay. So you didn't consider it 6 important to look at all of the available test 7 results for these in-use test vehicles before 8 you considered and used them in your analysis?</p> <p>9 MS. SMITH: Objection, form.</p> <p>10 THE WITNESS: So, again, I 11 focused on the FTP, because that's the 12 test where Mr. Smithers had a test 13 result that, you know, wasn't expected.</p> <p>14 BY MR. WOJTANOWICZ:</p>	<p>1 investigation to try to ascertain exactly what 2 GM did to examine these vehicles before it ran 3 the tests?</p> <p>4 A. I wasn't able to find anything 5 else, so no.</p> <p>6 Q. Did you ask for additional 7 information from General Motors about what they 8 did to inspect these vehicles before they ran 9 the tests?</p> <p>10 A. I did not. Again, my focus was on 11 Mr. Smithers' results and how his procedure 12 went. I wasn't asked to go back and validate 13 everything that GM had done. But all these 14 tests are, you know, the reason these tests are 15 done in-use and dyno testing is that anybody 16 can repeat them and they can be done at 17 multiple labs. So these types of tests you 18 follow the Federal Test Procedure to run these 19 tests so they're repeatable and can be compared 20 against each other.</p> <p>21 Q. But they're only repeatable if you 22 know precisely what was done for each test; 23 isn't that true?</p> <p>24 A. So that's why the Federal Test 25 Procedure is there is that if you follow that</p>
<p>9 Q. Okay. How did GM inspect the 10 vehicles that it was using for the test in 11 order to determine that they were mechanically 12 sound?</p> <p>13 A. So there's some information on here 14 about tire pressure being set, odometer miles, 15 and things along those lines. I don't remember 16 seeing much information on other aspects of the 17 vehicle.</p> <p>18 Q. Did you review any written 19 procedures for which components and elements of 20 the vehicles were to be examined before the 21 testing procedure?</p> <p>22 A. I looked for those. I thought 23 there was a few notes in here, but I wasn't 24 able to find a lot of information on that.</p> <p>25 Q. Did you conduct any additional</p>	<p>Page 339</p> <p>1 and then you can have repeatable results, which 2 is what EPA takes in from OEMs and their own 3 testing to make comparisons.</p> <p>4 Q. So you didn't feel that it was 5 necessary in order to rely upon this data to 6 know what, if anything, was done to determine 7 if there were any mechanical or other issues 8 with the vehicles that were being tested?</p> <p>9 A. Again, my focus was on Mr. 10 Smithers' test. You know, the one, the one 11 vehicle that tested above the limit, there was 12 documentation that the MIL light activated just 13 after the test for, I believe, an exhaust 14 manifold bolt that was loose and caused an 15 exhaust leak. So that was one that had a 16 documented maintenance issue.</p> <p>17 Q. Well, I'm asking you a different 18 question. You put in your report a table 19 summarizing all these test results from the 20 in-use testing. You compared these tests to 21 the tests that Mr. Smithers conducted. So I'm 22 asking you whether you considered it important 23 to know how those vehicles were inspected prior 24 to being tested for purposes of relying on 25 these test results in your report.</p>

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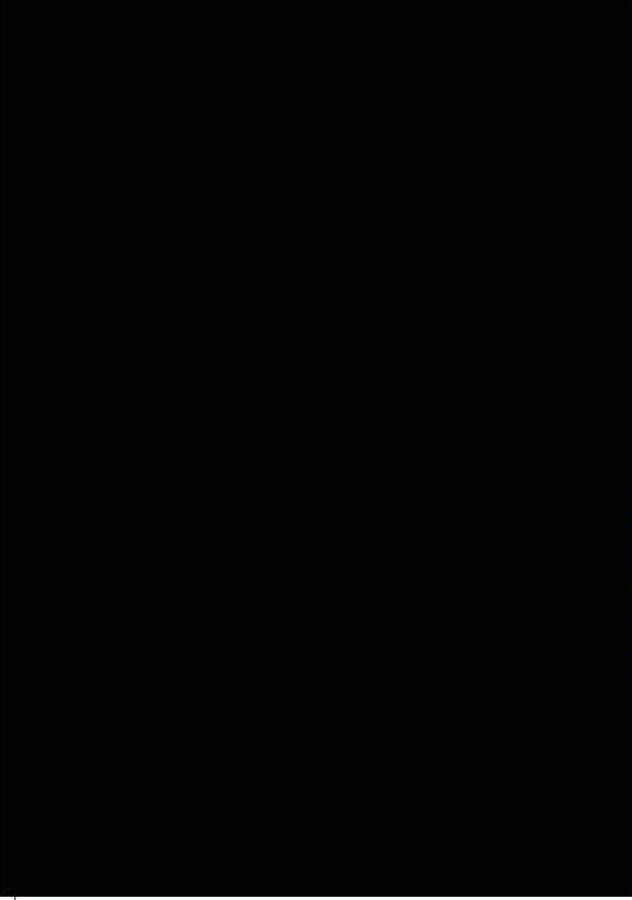
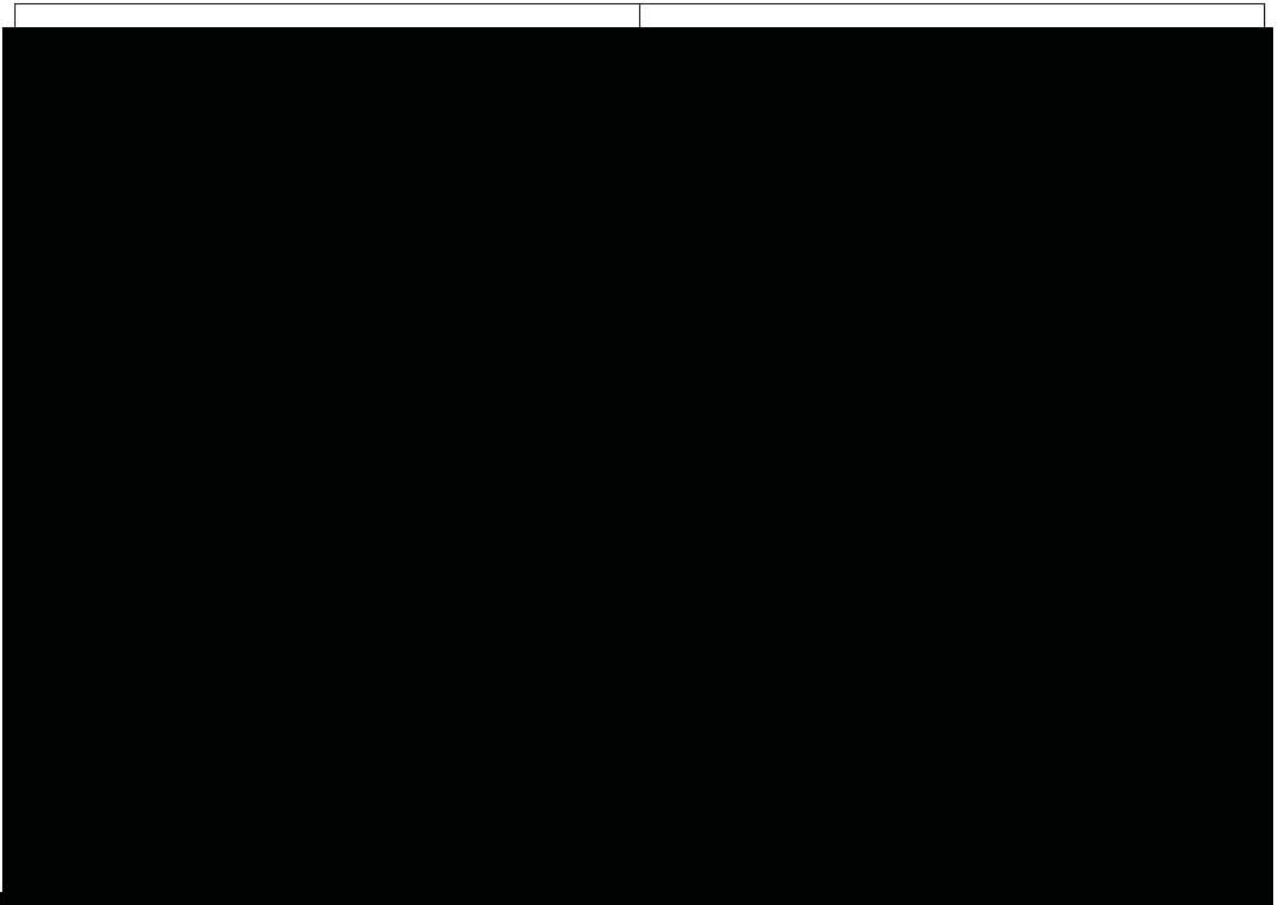
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<p style="text-align: right;">Page 340</p> <p>1 MS. SMITH: Objection, form,</p> <p>2 compound. Asked and answered.</p> <p>3 THE WITNESS: So, again, my</p> <p>4 focus is on Mr. Smithers' testing. You</p> <p>5 know, I compared these results as part</p> <p>6 of my consideration, but my opinions</p> <p>7 are based on the procedures that he had</p> <p>8 done on the vehicle that he had that</p> <p>9 showed above the limit with no</p> <p>10 additional analyses on his part to</p> <p>11 understand why his vehicle was not</p> <p>12 compliant.</p> <p>13 BY MR. WOJTANOWICZ:</p> <p>14 Q. Mr. Harrington, that answer was not</p> <p>15 responsive to my question. I'm going to ask</p> <p>16 you again to respond to the question I'm</p> <p>17 actually asking you, which is, before you put</p> <p>18 in your report a summary and relied upon the</p> <p>19 test results from this in-use testing, did you</p> <p>20 feel it was important to understand how the</p> <p>21 vehicles were inspected for mechanical problems</p> <p>22 prior to there being tested?</p> <p>23 MS. SMITH: Objection, form.</p> <p>24 Objection, asked and answered.</p> <p>25 THE WITNESS: I looked at</p>	<p style="text-align: right;">Page 342</p> <p>1 MS. SMITH: We still just</p> <p>2 don't have the folder, so if people</p> <p>3 could email it again. Oh, I got it.</p> <p>4 Thank you.</p> <p>5 THE TECHNICIAN: You have</p> <p>6 the folder now, Renee?</p> <p>7 MS. SMITH: No, I have the</p> <p>8 email.</p> <p>9 MR. BRODSKY: This doesn't</p> <p>10 need to be on the record.</p> <p>11 -----</p> <p>12 (Discussion was held off the record.)</p> <p>13 -----</p> <p>14 MS. SMITH: Why don't we do</p> <p>15 this off the record? For now, let's</p> <p>16 just do the email and then we can play</p> <p>17 around with this. Thank you.</p> <p>18 MR. WOJTANOWICZ: Okay. It</p> <p>19 appears that my ability to introduce</p> <p>20 them online is still not back up.</p> <p>21 THE TECHNICIAN: I can do</p> <p>22 so. Let me do that for you, please.</p> <p>23 It's number six as introduced as --</p> <p>24 it's number five introduced as number</p> <p>25 six, correct?</p>
<p style="text-align: right;">Page 341</p> <p>1 the data that I had to see what was</p> <p>2 there and reviewed the information that</p> <p>3 was there, but I did not ask for</p> <p>4 additional information.</p> <p>5 BY MR. WOJTANOWICZ:</p> <p>6 Q. Okay. I'm going to introduce</p> <p>7 another exhibit now, I guess I can try to do it</p> <p>8 electronically, but at the same time if my</p> <p>9 colleagues could email it for me, please, it's</p> <p>10 going to be tab number five in my private</p> <p>11 exhibit folder and this will be introduced as</p> <p>12 Exhibit No. 6, I believe.</p> <p>13 -----</p> <p>14 (Privately-Owned Vehicle Work Order</p> <p>15 Bates GMCOUNTS000852050 marked</p> <p>16 Harrington Exhibit 6 for</p> <p>17 identification.)</p> <p>18 -----</p> <p>19 THE WITNESS: So for me,</p> <p>20 which exhibit will it be? Will it be</p> <p>21 five for me as well?</p> <p>22 MR. WOJTANOWICZ: It will be</p> <p>23 tab five in that box, yes.</p> <p>24 THE TECHNICIAN: I'm on the</p> <p>25 line if you have issues. Thank you.</p>	<p style="text-align: right;">Page 343</p> <p>1 MR. WOJTANOWICZ: Correct.</p> <p>2 BY MR. WOJTANOWICZ:</p> <div style="background-color: black; height: 400px; width: 100%;"></div>

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15 Q. And can you point to any document  
16 in your report that you cited that actually  
17 does contain any detailed instructions for  
18 mechanical or electronic inspection of the  
19 vehicles prior to testing?

20 A. I don't remember a document that's  
21 referenced in my report with that information,  
22 no.

23 Q. But any documents that you did  
24 review and rely on would be cited in your  
25 report, correct?

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<p style="text-align: right;">Page 356</p> <p>1 would be then on your internal?</p> <p>2 MR. WOJTANOWICZ: Yeah, it</p> <p>3 would be what I'm referring to is tab</p> <p>4 number three and it's Exhibit 5 is the</p> <p>5 first one introduced today.</p> <p>6 THE WITNESS: The Bates</p> <p>7 number on the very first page, could</p> <p>8 you repeat that again?</p> <p>9 MR. WOJTANOWICZ: Yeah, the</p> <p>10 number on the first page,</p> <p>11 GMCOUNTS852163.</p> <p>12 MS. SMITH: Is it the one</p> <p>13 you emailed today, Garth?</p> <p>14 MR. WOJTANOWICZ: Yes.</p> <p>15 THE WITNESS: Okay. I have</p> <p>16 found that document.</p> <p>17 MS. SMITH: Got it. Thank</p> <p>18 you, sorry.</p> <p>19 BY MR. WOJTANOWICZ:</p> <p>20 Q. All right. So on page, are you at</p> <p>21 page 198?</p> <p>22 A. Let me get to 198. Okay.</p> <p>23 Q. Do you see there in the middle of</p> <p>24 the page it says "Truck Driver Monitoring</p> <p>25 Report"?</p>	<p style="text-align: right;">Page 358</p> <p>1 Q. But when it says no violations,</p> <p>2 this test, that simply means that the driver</p> <p>3 stayed within the leeway allowed by those plus</p> <p>4 or minus 2 miles per hour and one second</p> <p>5 parameters, correct?</p> <p>6 A. Yes, the software and realtime</p> <p>7 evaluates how the driver is doing compared to</p> <p>8 the profile and at the end of the test it will</p> <p>9 tell you whether he had violations or not.</p> <p>10 Q. Did you calculate the RPA for each</p> <p>11 of the in-use tests conducted on these</p> <p>12 vehicles?</p> <p>13 A. Again, I wasn't going back and</p> <p>14 revalidating all of this work, so I did not go</p> <p>15 calculate the RPA for these tests.</p> <p>16 Q. Nor did you calculate the VA</p> <p>17 positive calculation that we discussed</p> <p>18 yesterday?</p> <p>19 A. That's correct.</p> <p>20 Q. Did you review the QA/QC data for</p> <p>21 each test?</p> <p>22 A. I don't remember going back to the</p> <p>23 QA/QC data.</p> <p>24 Q. Explain for the record, if you</p> <p>25 would, what is QA/QC data?</p>
<p style="text-align: right;">Page 357</p> <p>1 A. Yes.</p> <p>2 Q. And this particular report relates</p> <p>3 to the HWFET, correct?</p> <p>4 A. That's my understanding, yes.</p> <p>5 Q. And then it says the limits are</p> <p>6 plus or minus 2 miles per hour, 1.0 seconds; is</p> <p>7 that right?</p> <p>8 A. Correct.</p> <p>9 Q. So is it your understanding that</p> <p>10 the leeway allowed for a driver operating the</p> <p>11 HWFET test is to stay within 2 miles per hour</p> <p>12 of the prescribed speed and to achieve those</p> <p>13 speeds within one second of the prescribed time</p> <p>14 at which those speeds should be achieved?</p> <p>15 A. That's my understanding.</p> <p>16 Q. And it says there were no</p> <p>17 violations during this test, right?</p> <p>18 A. Correct.</p> <p>19 Q. Did you have access to the</p> <p>20 underlying test data for the HWFET and FTP-75</p> <p>21 tests that were run on these in-use testing</p> <p>22 vehicles?</p> <p>23 A. I did not look at them. They may</p> <p>24 have been there, but I don't remember analyzing</p> <p>25 those.</p>	<p style="text-align: right;">Page 359</p> <p>1 A. It's quality assurance, quality</p> <p>2 control, which is a generic engineering term,</p> <p>3 so it's going back and doing some checks on</p> <p>4 whether or not you stayed within specified</p> <p>5 limits or if things were done properly.</p> <p>6 Q. Do you know how the vehicles were</p> <p>7 preconditioned for every test cycle for these</p> <p>8 in-use tests?</p> <p>9 A. I don't remember looking through</p> <p>10 those. Obviously, there's a prescribed way</p> <p>11 that it needs to be done, but I didn't see the</p> <p>12 verification of how those were done.</p> <p>13 Q. Did you examine the maintenance</p> <p>14 records for each of the vehicles that GM used</p> <p>15 for these in-use testing -- tests?</p> <p>16 A. I looked where I could find the</p> <p>17 tire pressures, but I don't remember analyzing</p> <p>18 the maintenance results for these vehicles.</p> <p>19 Q. Do you remember seeing any -- you</p> <p>20 don't cite any maintenance records in your</p> <p>21 report, did you have access to any maintenance</p> <p>22 records for any of these testing vehicles?</p> <p>23 MS. SMITH: Objection, form.</p> <p>24 THE WITNESS: I'm not aware</p> <p>25 of them, no.</p>



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<p style="text-align: right;">Page 360</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. Do you know whether GM inspected</p> <p>3 any maintenance records for the vehicles that</p> <p>4 it used for its in-use testing?</p> <p>5 A. I don't have that information, no.</p> <p>6 Q. So I would like you to turn back to</p> <p>7 Exhibit No. 1 in your report and the chart at</p> <p>8 page 17.</p> <p>9 A. Okay.</p> <p>10 Q. So you compiled this chart based on</p> <p>11 documents that you reviewed in this case,</p> <p>12 correct?</p> <p>13 A. Correct.</p> <p>14 Q. Those documents are cited in</p> <p>15 footnotes down below?</p> <p>16 A. That is correct.</p> <p>17 Q. And basically it just identifies</p> <p>18 the vehicle by V.I.N. number and also by a sort</p> <p>19 of identifying number that GM assigned to it</p> <p>20 for purposes of its test; is that right?</p> <p>21 A. That's my understanding of the</p> <p>22 numbers, yes.</p> <p>23 Q. It shows the date of the tests, the</p> <p>24 mileage that GM recorded for the vehicle, and</p> <p>25 then it has a couple of results in the last two</p>	<p style="text-align: right;">Page 362</p> <p>1 see how frequently the DPF would regen</p> <p>2 and then there's a calculation that</p> <p>3 developed the upward adjustment factor</p> <p>4 and that's what has been added to the</p> <p>5 first column to get that second column.</p> <p>6 BY MR. WOJTANOWICZ:</p> <p>7 Q. Okay. At this point, I would like</p> <p>8 you to pull out tab number ten and I would like</p> <p>9 to introduce, if Ali would for me, please, and</p> <p>10 or whoever sending emails for me, tab number</p> <p>11 ten, which will be an Exhibit --</p> <p>12 THE TECHNICIAN: It will be</p> <p>13 Exhibit No. 9. Your exhibit has been</p> <p>14 introduced. Thank you.</p> <p>15 -----</p> <p>16 (Calculator Document Bates</p> <p>17 GMCOUNTS000852229 marked Harrington</p> <p>18 Exhibit 9 for identification.)</p> <p>19 -----</p> <p>20 MR. WOJTANOWICZ: So wait a</p> <p>21 second for Renee and David to receive</p> <p>22 see the email.</p> <p>23 MS. SMITH: Yeah, I don't</p> <p>24 have it yet, but I'll yell as soon as</p> <p>25 it gets here.</p>
<p style="text-align: right;">Page 361</p> <p>1 columns, correct?</p> <p>2 A. Correct.</p> <p>3 Q. Now, the first column shows FTP --</p> <p>4 well, let me back up. What this is summarizing</p> <p>5 are just the FTP-75 results that GM recorded</p> <p>6 for these vehicles, right?</p> <p>7 A. That's correct.</p> <p>8 Q. As we established earlier, you</p> <p>9 didn't examine or include the HWFET results?</p> <p>10 A. That is correct.</p> <p>11 Q. Now, the first, or the second to</p> <p>12 last column shows the FTP NOx score without</p> <p>13 adjustment factors and then the one after that</p> <p>14 shows it with adjustment factors. So my</p> <p>15 question is, the adjustment factor basically is</p> <p>16 a number that gets added to a sort of raw score</p> <p>17 in order to account for additional NOx that a</p> <p>18 vehicle will tend to produce because of the</p> <p>19 regeneration cycles that it will go through in</p> <p>20 the real world, but that aren't shown on the</p> <p>21 certification cycles?</p> <p>22 MS. SMITH: Objection, form.</p> <p>23 THE WITNESS: So it's an</p> <p>24 additive factor not just for in the</p> <p>25 real world, but GM had to do testing to</p>	<p style="text-align: right;">Page 363</p> <p>1 MR. BRODSKY: I'm able to to</p> <p>2 pull it up on the screen. So I'm good,</p> <p>3 thanks.</p> <p>4 MS. SMITH: I received the</p> <p>5 email.</p> <p>6 BY MR. WOJTANOWICZ:</p> <p>7 Q. Mr. Harrington, Exhibit No. 9, or</p> <p>8 maybe you're still looking for it?</p> <p>9 A. Nope, I've got it.</p> <p>10 Q. And that's the document</p> <p>11 GMCOUNTS85229, correct?</p> <p>12 A. That's what I have.</p> <div style="background-color: black; height: 200px; width: 100%;"></div>



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22 Q. So I would now like to introduce  
23 and this one is going to have to be --  
24 Mr. Harrington, the next exhibit, I don't have  
25 a paper copy for you, so I'll ask Ali to

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<p style="text-align: right;">Page 380</p> <p>1 going to be removed by the emissions system of</p> <p>2 the diesel Cruze has done its work, correct?</p> <p>3 A. Could you state that again?</p> <p>4 Q. The leak that was identified came</p> <p>5 in a point in the emissions system that is</p> <p>6 after the FCR system, after the entire exhaust</p> <p>7 treatment system has done its work and anything</p> <p>8 that would pass that point is ultimately</p> <p>9 heading to the tailpipe, correct?</p> <p>10 MS. SMITH: Objection, form.</p> <p>11 THE WITNESS: So a leak in</p> <p>12 an exhaust after-treatment system can</p> <p>13 suck air in and it can expel exhaust</p> <p>14 out and then that NOx sensor also is</p> <p>15 part of the feedback loop, it helps the</p> <p>16 emissions system understand how it's</p> <p>17 performing from a NOx perspective, so</p> <p>18 there's potential impacts for how the</p> <p>19 system is operating and the exhaust</p> <p>20 that's measured -- or the exhaust</p> <p>21 emissions that are measured at the</p> <p>22 tailpipe.</p> <p>23 BY MR. WOJTANOWICZ:</p> <p>24 Q. Move to strike that as</p> <p>25 nonresponsive. I asked you a simple question.</p>	<p style="text-align: right;">Page 382</p> <p>1 out, it's going to be letting out everything</p> <p>2 that's in that exhaust, including NOx, correct?</p> <p>3 A. It could, yes. However, it's going</p> <p>4 to impact or could impact the NOx sensor</p> <p>5 reading and impact how the vehicle is operating</p> <p>6 and the vehicle's understanding of how much</p> <p>7 tailpipe NOx is coming out in the SCR</p> <p>8 efficiency. So it could impact the emissions</p> <p>9 system and the control system.</p> <p>10 Q. But you didn't do any analysis to</p> <p>11 see whether, A, whether the system was actually</p> <p>12 sucking in any air at any given time, did you?</p> <p>13 A. Not during the inspection and I</p> <p>14 didn't do an analyses, that's, you know, Mr.</p> <p>15 Smithers -- it's Mr. Smithers' testing, I</p> <p>16 wasn't aware of the testing and didn't evaluate</p> <p>17 whether or not there was an impact of that leak</p> <p>18 on his results in the operation of that</p> <p>19 vehicle.</p> <p>20 Q. Now, going back to -- do you recall</p> <p>21 at page 56 of your report, if you would turn</p> <p>22 there, please, quickly.</p> <p>23 A. Okay.</p> <p>24 Q. Actually, let me go back for a</p> <p>25 second. Do you know in fact whether the leak</p>
<p style="text-align: right;">Page 381</p> <p>1 The leak that you identified came after the</p> <p>2 emissions control system in terms of the</p> <p>3 physical layout of the vehicle, correct?</p> <p>4 A. So it didn't come after the control</p> <p>5 system. It came at the last point in the</p> <p>6 control system for the emissions system.</p> <p>7 Q. It was past the last NOx sensor,</p> <p>8 correct?</p> <p>9 A. It was at the last NOx sensor.</p> <p>10 Q. Now, what did you do to analyze</p> <p>11 whether that leak was -- one of the things that</p> <p>12 could happen with a leak developing at that</p> <p>13 point is that NOx and other emitants or other</p> <p>14 exhaust could be leaking out of that, correct?</p> <p>15 A. So there's pulsation in the exhaust</p> <p>16 after -- or exhaust system, so some exhaust can</p> <p>17 leave and other times air can come into the</p> <p>18 system.</p> <p>19 Q. If exhaust is leaving, then that's</p> <p>20 actually going to reduce the amount of tailpipe</p> <p>21 NOx that's being measured either by a dyno</p> <p>22 system or by a PEMS system, correct?</p> <p>23 A. Right, it could impact that NOx</p> <p>24 reading.</p> <p>25 Q. I mean, if it's letting exhaust</p>	<p style="text-align: right;">Page 383</p> <p>1 in the emissions system that was detected</p> <p>2 during the vehicle inspection in fact impacted</p> <p>3 any test results?</p> <p>4 A. I don't have evidence of when that</p> <p>5 exhaust leak occurred, so I can't determine the</p> <p>6 impact, but it's a -- having a known</p> <p>7 maintenance issue on a vehicle, you know, can</p> <p>8 impact the operation of the vehicle and Mr.</p> <p>9 Smithers did not perform a leak test, so it's</p> <p>10 unclear when that leak test developed or when</p> <p>11 that leak developed.</p> <p>12 Q. And just to be clear, GM didn't</p> <p>13 perform any leak tests on its test vehicles for</p> <p>14 purposes of in-use testing, did it?</p> <p>15 A. They listened for leaks, so they</p> <p>16 did perform a leak test.</p> <p>17 Q. You don't know in fact whether Mr.</p> <p>18 Smithers or anyone else performing the PEMS</p> <p>19 testing or the dyno testing also listened for</p> <p>20 leaks, do you?</p> <p>21 A. I don't -- there was no evidence</p> <p>22 that the leak test was performed and I thought</p> <p>23 there was a discussion in Mr. Smithers'</p> <p>24 deposition that he did not check for leak</p> <p>25 tests, but I can't remember exactly how that</p>



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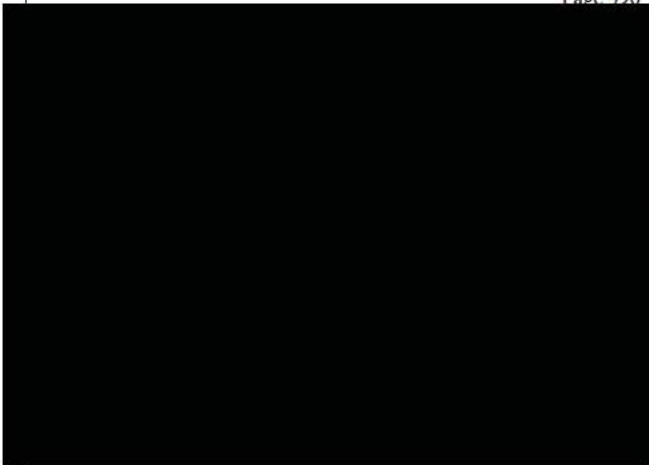
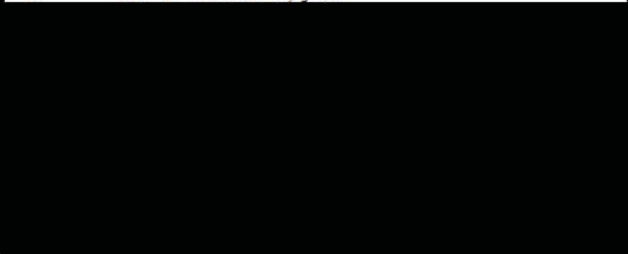
1 A. So you said between the first and  
2 the second?  
3 Q. Correct.  
4 A. I didn't do that math, but you're  
5 saying it's greater than 12 percent?  
6 Q. Yes.  
7 A. Doing the math in my head, it looks  
8 like it is greater than 12 percent.  
9 Q. But you didn't reject either of  
10 those test results for purposes of your  
11 analysis in this case, did you?  
12 MS. SMITH: Objection, form.  
13 THE WITNESS: So, again,  
14 those were considered. What I was here  
15 to do was to evaluate Mr. Smithers'  
16 vehicle, which had a vehicle that was  
17 over the certification limit, over the  
18 standard, had an exhaust leak, had an  
19 open recall, had documentation that  
20 didn't define some of the maintenance  
21 records in the report. So there was  
22 many, many red flags with this vehicle  
23 in addition to having a result that  
24 wasn't similar to the other tests for  
25 in-use.

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1 BY MR. WOJTANOWICZ:



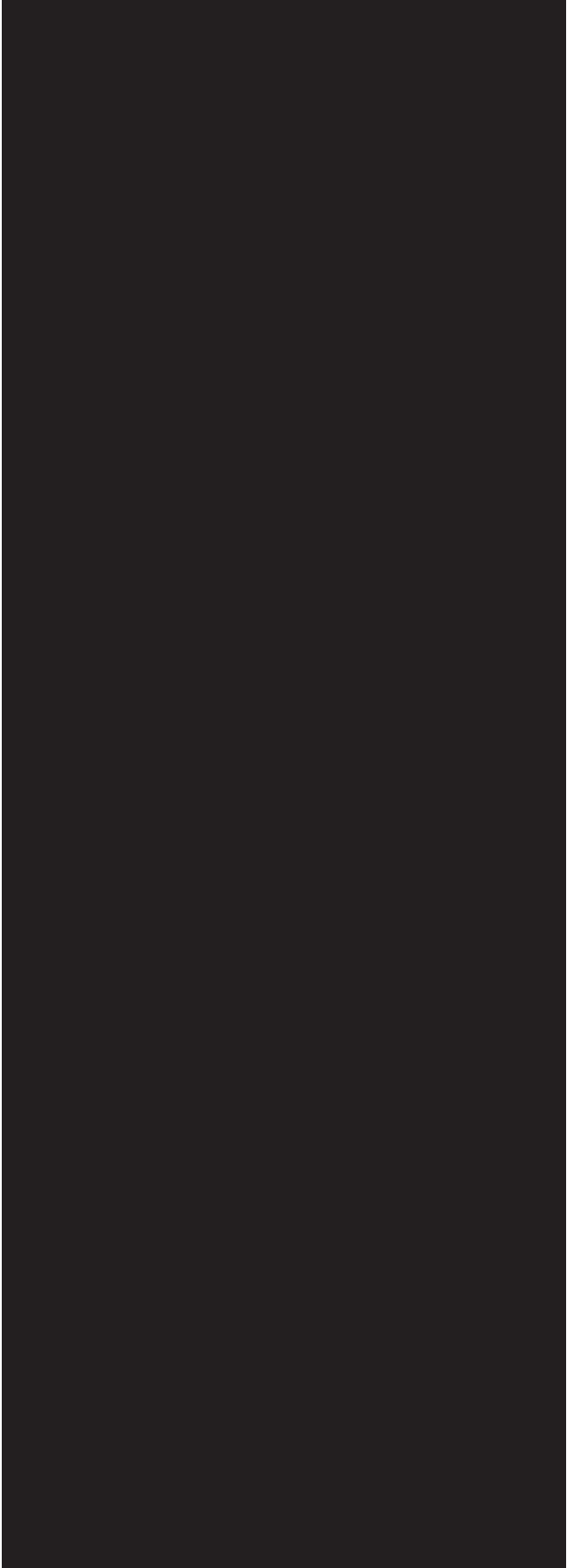
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<p style="text-align: right;">Page 396</p> 	<p style="text-align: right;">Page 398</p> <p>1 BY MR. WOJTANOWICZ:</p> <p>2 Q. And you have attempted to be</p> <p>3 reasonable and robust in rendering your</p> <p>4 engineering opinions as outlined in your</p> <p>5 report, haven't you?</p> <p>6 A. I've tried to, yes.</p> 
<p>15 Q. And it's not of concern to you if</p> <p>16 the vehicle achieves a score, a NOx value on</p> <p>17 the test, that is very near but not quite above</p> <p>18 the certification standard, that's not a</p> <p>19 concern to you, right?</p> <p>20 MS. SMITH: Objection, form.</p> <p>21 THE WITNESS: You know, it's</p> <p>22 reasonable to look at that, but it's</p> <p>23 still, you know, underneath the</p> <p>24 standard and there's -- the standard is</p> <p>25 there for a reason and it met that. It</p>	<p>20 Q. So you didn't feel the need to</p> <p>21 apply these same reasonable and robust</p> <p>22 engineering standards to your own reliance on</p> <p>23 the test data cited in the summary table on</p> <p>24 page 17?</p> <p>25 MS. SMITH: Objection, form.</p>
<p style="text-align: right;">Page 397</p> <p>1 met the standard.</p> <p>2 BY MR. WOJTANOWICZ:</p> <p>3 Q. Okay. But you've drawn the line in</p> <p>4 anything above the certification standard, in</p> <p>5 your view, the results indicate some problem</p> <p>6 with the vehicle and you've got to discount</p> <p>7 those results?</p> <p>8 MS. SMITH: Objection, form.</p> <p>9 And misstates his testimony.</p> <p>10 THE WITNESS: So a</p> <p>11 reasonable and robust engineering</p> <p>12 analyses would understand why that was</p> <p>13 and that's the concern here is it's a</p> <p>14 red flag that would -- a typical</p> <p>15 engineer would try to understand why</p> <p>16 that was. I didn't see any evidence</p> <p>17 that Mr. Smithers did anything other</p> <p>18 than state that he thought it was close</p> <p>19 enough. However, there was a NOx</p> <p>20 sensor that was replaced right at that</p> <p>21 time, so, you know, of a result like</p> <p>22 that, in a typical robust engineering</p> <p>23 would require additional analyses to</p> <p>24 understand, you know, why that</p> <p>25 unexpected result was observed.</p>	<p style="text-align: right;">Page 399</p> <p>1 Misstates his testimony.</p> <p>2 THE WITNESS: Again, I</p> <p>3 considered these data, but my focus was</p> <p>4 on Mr. Smithers' vehicle and the known</p> <p>5 maintenance issues at the time of the</p> <p>6 inspection.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. I'm now going to introduce another</p> <p>9 exhibit. Let me see if I can do this directly.</p> <p>10 Could you remind what exhibit number we're on,</p> <p>11 please, court reporter?</p> <p>12 THE TECHNICIAN: You're on</p> <p>13 Exhibit 10.</p> <p>14 MR. WOJTANOWICZ: So the</p> <p>15 next one is 11.</p> <p>16 THE TECHNICIAN: Which tab</p> <p>17 would you like?</p> <p>18 MR. WOJTANOWICZ: That is</p> <p>19 tab number four, please. Yeah, I tried</p> <p>20 it, it's not working.</p> <p>21 THE TECHNICIAN: Okay. One</p> <p>22 moment, please.</p> <p>23 MS. SMITH: Garth, did you</p> <p>24 say it is loaded up or you're having</p> <p>25 difficulty?</p>

21 (Pages 396 - 399)



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<p>1 MR. WOJTANOWICZ: We're not 2 able to. 3 THE TECHNICIAN: Exhibit 11, 4 tab number four, thank you. 5 MS. SMITH: I've got it. 6 ----- 7 (Email dated 5/16/19 Bates 8 GMCOUNTS000852424 marked Harrington 9 Exhibit 11 for identification.) 10 ----- 11 BY MR. WOJTANOWICZ: 12 Q. So Mr. Harrington, you're opening 13 up envelope number four there? 14 A. Yes, I am.</p>	



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23 Q. Now, I would like to introduce the  
24 next exhibit, which is tab number 11. It will  
25 be Exhibit No. 12.

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1 THE TECHNICIAN: Your  
2 exhibit has been introduced. Please  
3 refresh your screens. Thank you.

4 MS. SMITH: That works for  
5 me. It's a miracle it's working.

6 -----

7 (Email String Bates  
8 GMCOUNTS000852421 TO 852422 marked  
9 Harrington Exhibit 12 for  
10 identification.)

11 -----

12 BY MR. WOJTANOWICZ:

13 Q. Do you have that in front of you,  
14 Mr. Harrington?

15 A. I do.

23 (Pages 404 - 407)



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24 (Pages 408 - 411)



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26 (Pages 416 - 419)



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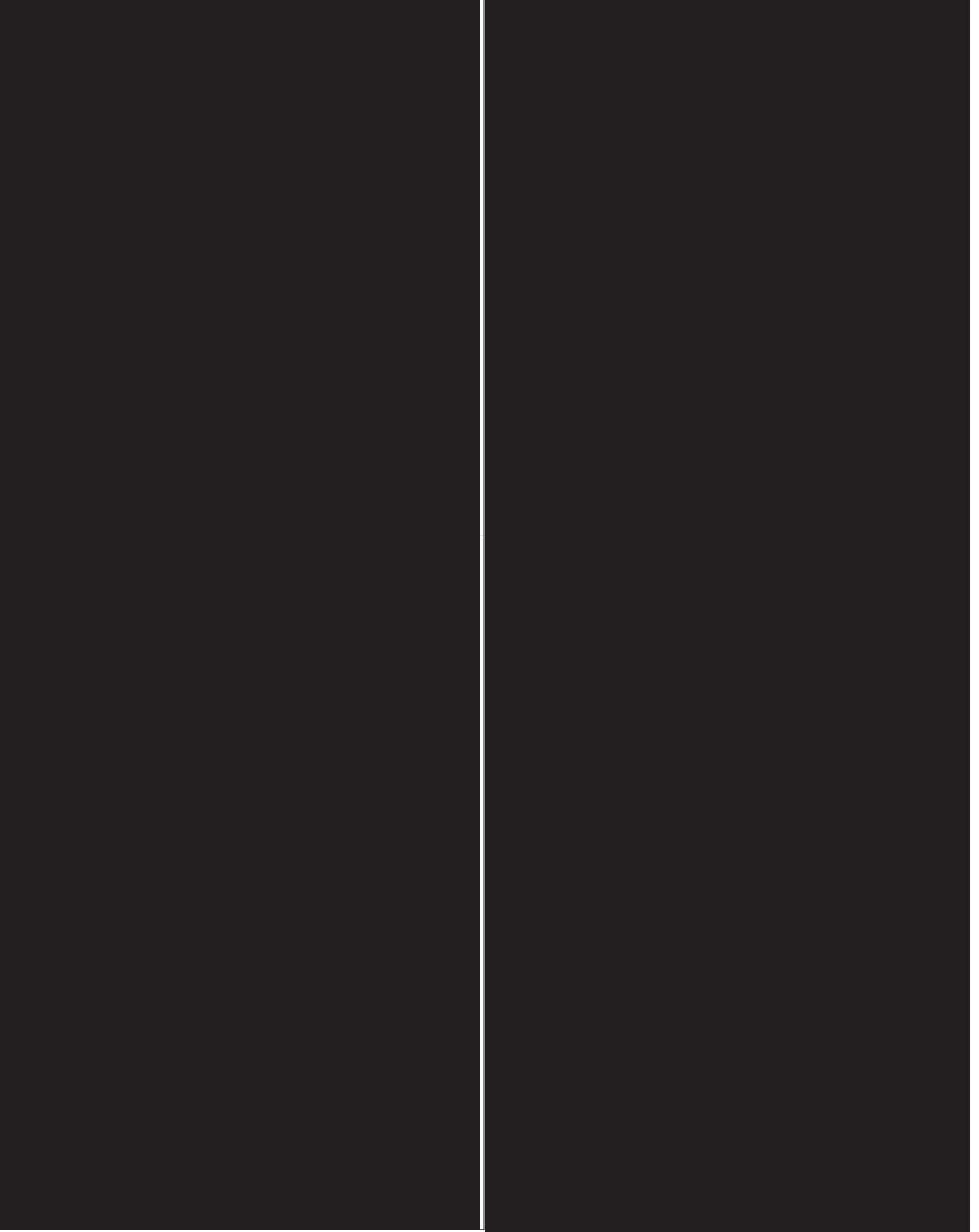
Page 440	Page 442
<p>1 understanding how you are meaning</p> <p>2 spirit.</p> <p>3 BY MR. WOJTANOWICZ:</p> <p>4 Q. Okay. Have you never heard that</p> <p>5 phrase before?</p> <p>6 A. I've --</p> <p>7 MS. SMITH: Objection, form.</p> <p>8 THE WITNESS: I've heard the</p> <p>9 phrase -- sorry.</p> <p>10 MS. SMITH: Go ahead.</p> <p>11 THE WITNESS: I've heard the</p> <p>12 phrase, but I don't know there's an</p> <p>13 exact definition of it.</p> <p>14 MS. SMITH: Garth, when</p> <p>15 you're done with this document, if it's</p> <p>16 a good breaking point, that would be</p> <p>17 great.</p> <p>18 BY MR. WOJTANOWICZ:</p> <p>19 Q. Okay. I'm just reviewing my notes</p> <p>20 to see if I asked what I wanted about this.</p> <p>21 One second, please. You know, I would go back,</p> <p>22 please to page 4 of this document so we can put</p> <p>23 it away were we're done here</p>	<div style="background-color: black; width: 100%; height: 741px;"></div> <div><p>21 This is a good time to take a break,</p><p>22 please.</p><p>23 THE VIDEOGRAPHER: The time</p><p>24 is 12:54. We are off the record.</p><p>25 -----</p></div>



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1 (A recess was taken at this time.)  
2 -----  
3 THE VIDEOGRAPHER: The time  
4 is 1:08. We're on the record.  
5 BY MR. WOJTANOWICZ:



33 (Pages 444 - 447)

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19 Q. Okay. Now, one of the things, you  
20 recall that one of the things that you have  
21 indicated that you believe Mr. Smithers did was  
22 to not properly select a test route. Is that  
23 part of your opinion?

24 A. So his testing and test -- well,  
25 there isn't a single test route. I don't think

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1 he had test routes. I don't know how he  
2 selected the routes. He drove them and then  
3 segmented them, but there's not an actual test  
4 route that he did repeatedly. It's just a  
5 bunch of testing that he then segmented into  
6 different segments and analyzed.

7 Q. But one of the things that's  
8 implicit in your criticism of Mr. Smithers is  
9 that it's important to, you believe that it's  
10 important to select a proper test route in  
11 order to conduct PEMS testing as accurately as  
12 you can. Is that a fair summary of your  
13 opinion?

14 MS. SMITH: Objection, form.

15 THE WITNESS: So when you  
16 test something, you need to consider  
17 the different influences that influence  
18 the results from that test route or  
19 that segment and consider things like  
20 air conditioning use and hills and  
21 temperature and things like that.

22 BY MR. WOJTANOWICZ:

23 Q. And so part of your -- part of your  
24 opinion in this case is that the route selected  
25 is one of those things that influence or could

34 (Pages 448 - 451)



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1 influence the results on a PEMS test; is that  
2 true?

3 A. The routes and then what seems to  
4 be somewhat arbitrary segmentation by Mr.  
5 Smithers. So his test routes were conducted,  
6 but then they segmented them up to do his  
7 analyses, so he wasn't actually analyzing  
8 routes.

9 Q. Okay. But again, I'm going to ask  
10 you again, because I'm trying to get you to  
11 answer whether it's part of your opinion that  
12 the selection of the route is one of the  
13 considerations that you believe is important  
14 for accurate PEMS testing?

15 MS. SMITH: Objection, form.

16 THE WITNESS: It can be the  
17 selection of the route or when you do  
18 that the route that you evaluate it in  
19 the context of what the route really  
20 is.

21 BY MR. WOJTANOWICZ:

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36 (Pages 456 - 459)

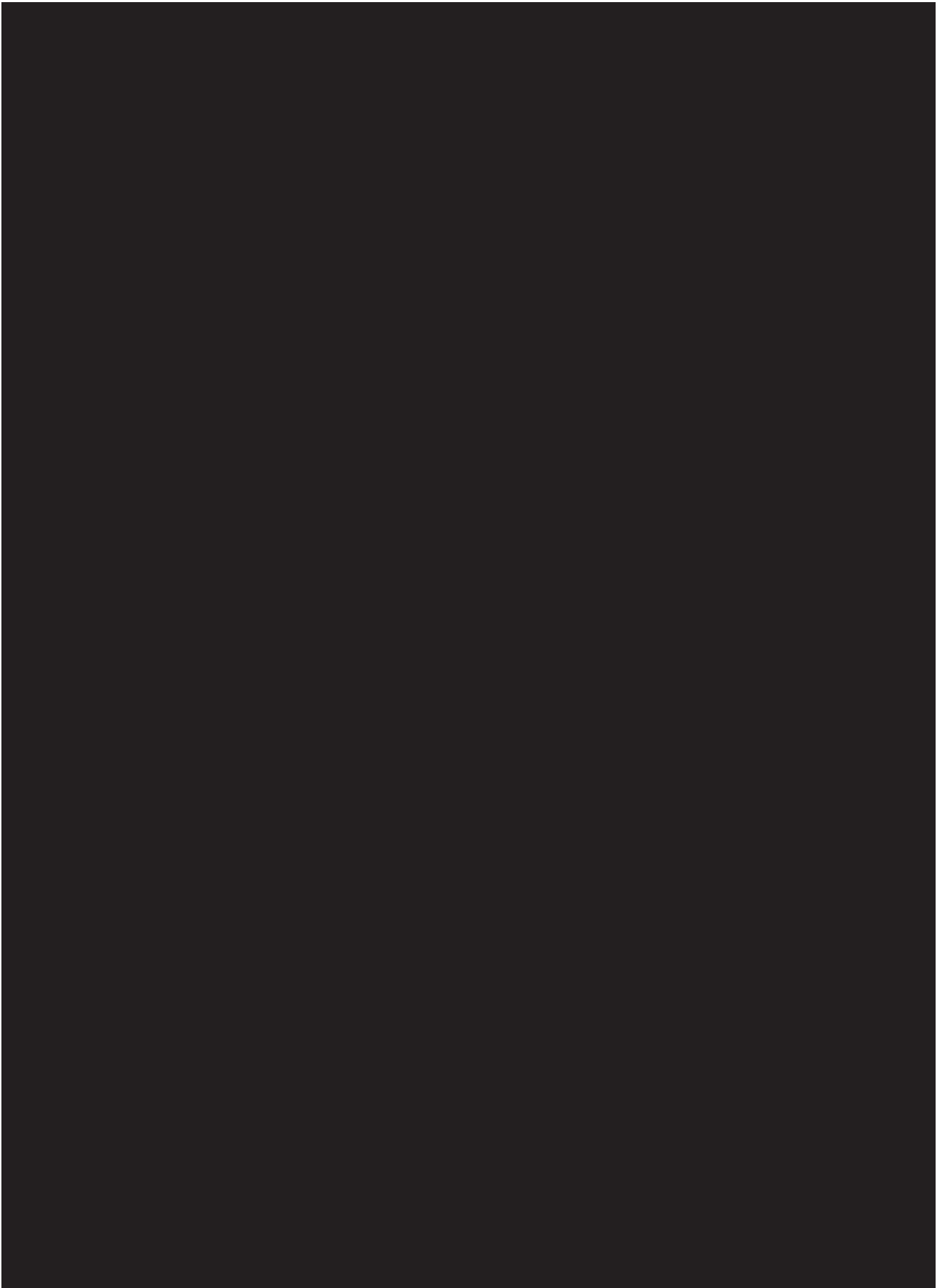


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37 (Pages 460 - 463)

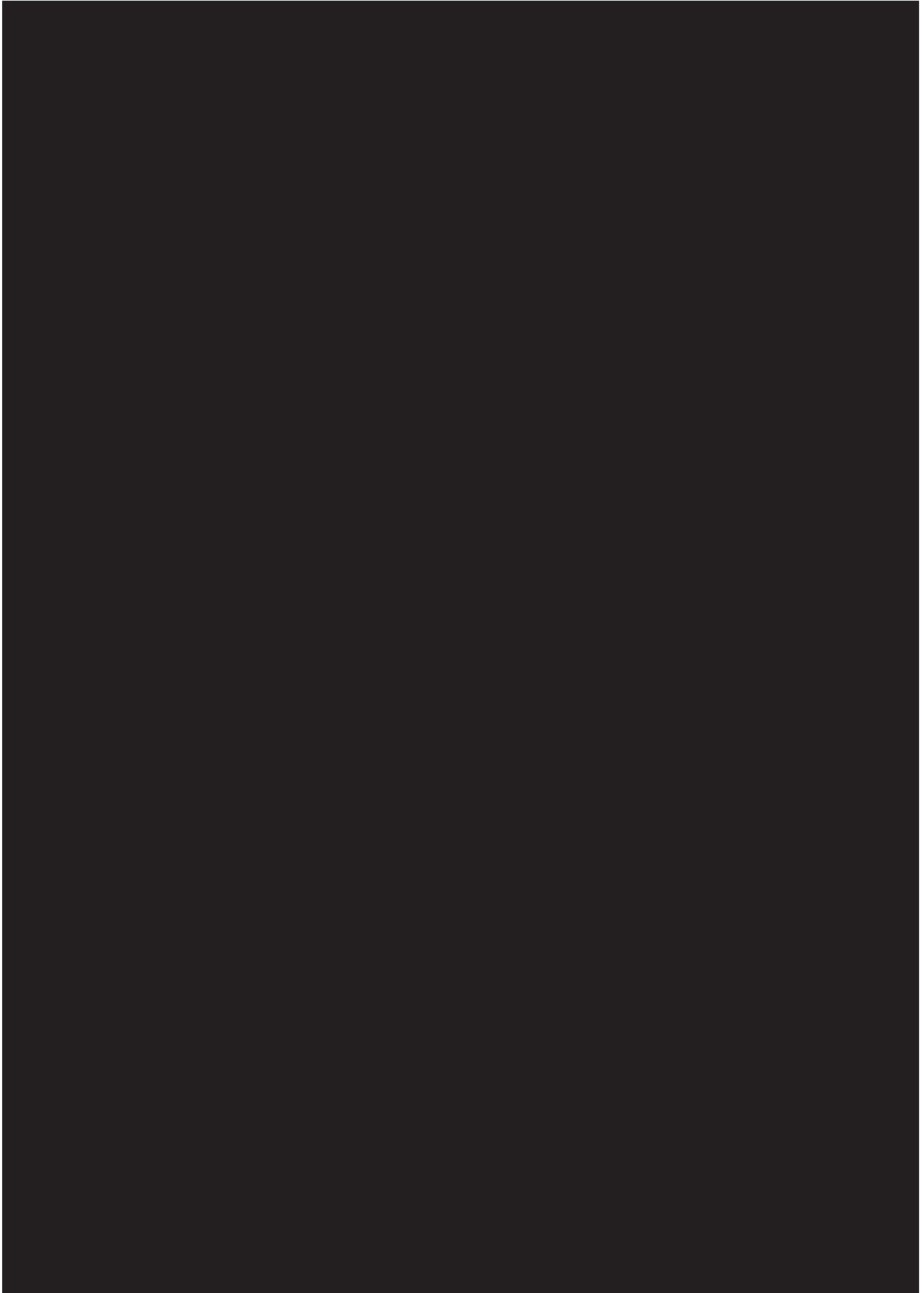
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38 (Pages 464 - 467)

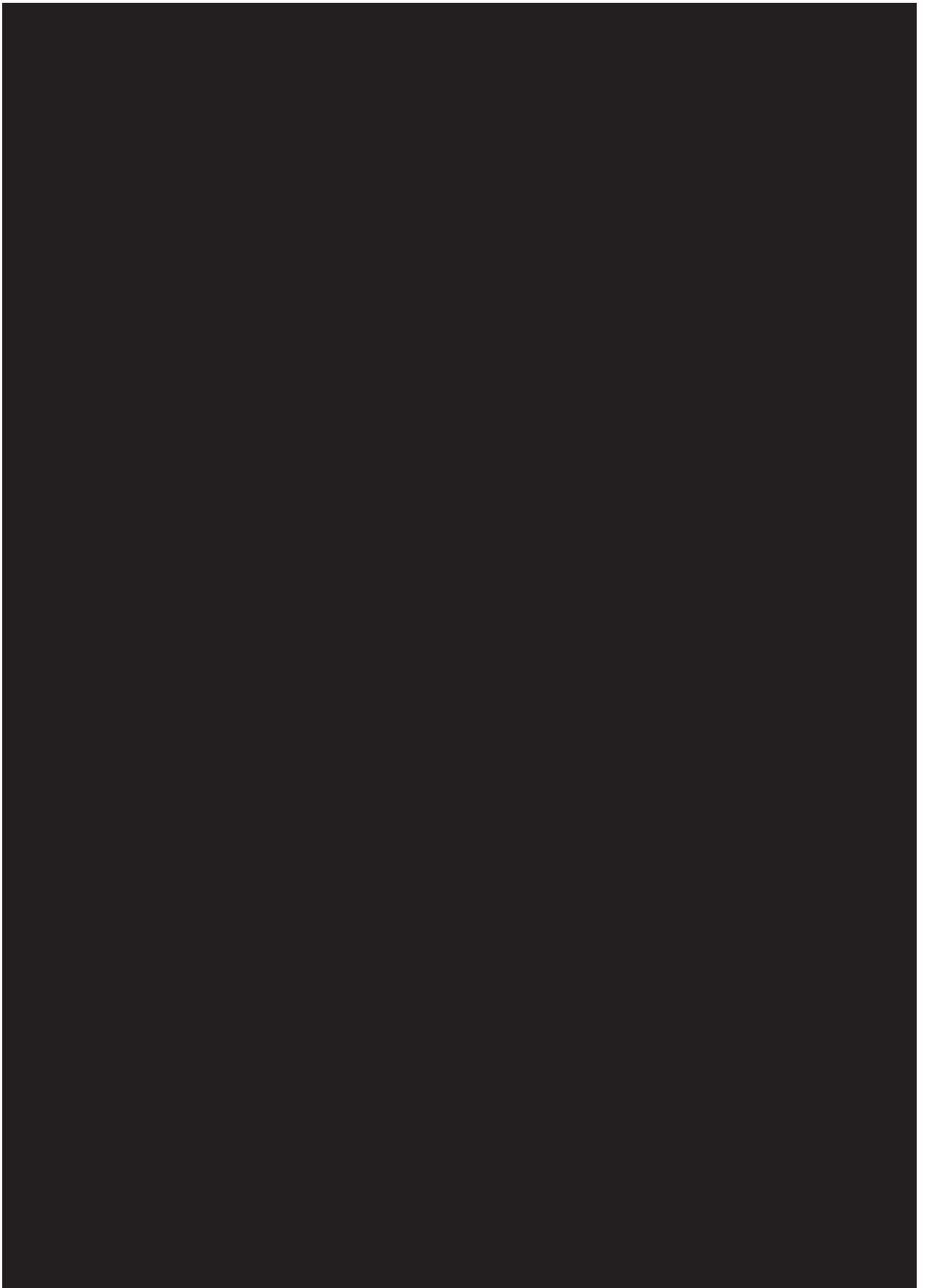


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39 (Pages 468 - 471)

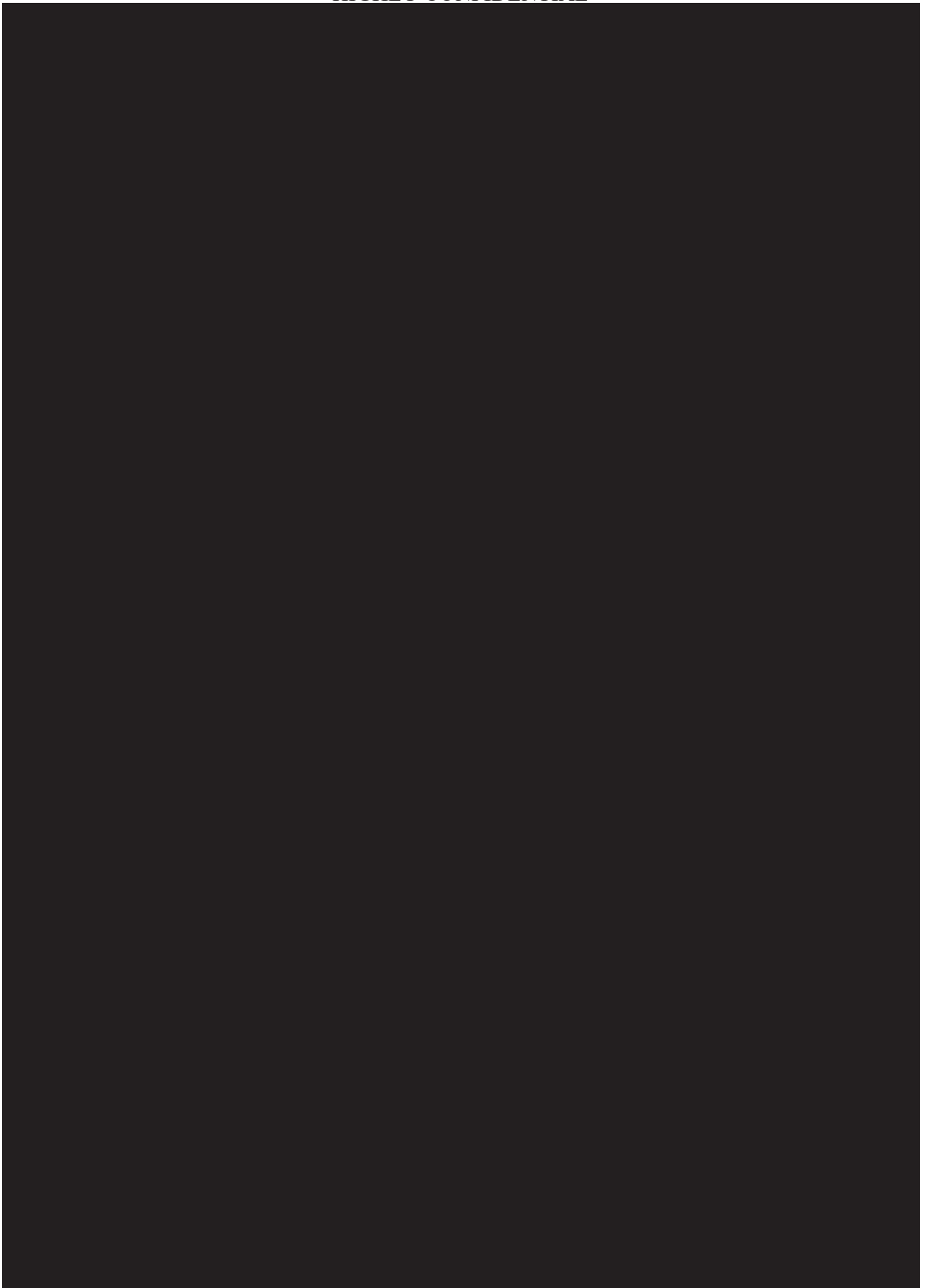
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40 (Pages 472 - 475)



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41 (Pages 476 - 479)

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42 (Pages 480 - 483)



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43 (Pages 484 - 487)

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7 BY MR. WOJTANOWICZ:

8 Q. What's your evidence that  
9 regulators here in the United States use or  
10 require calibration of a PEMS unit against the  
11 dynamometer?

12 MS. SMITH: Objection, form.

13 THE WITNESS: So it's listed  
14 in my report. It might take a second  
15 to find it. I believe it's in the  
16 appendices. Sorry, it's taking me a  
17 second. So on page -- well, it's in  
18 Appendix E, page 27, at the bottom of  
19 the second paragraph, it says  
20 "Moreover, PEMS equipment verification  
21 against laboratory equipment is also  
22 regulated within the United States with  
23 PEMS measurements are being used to  
24 verify heavy duty not to exceed  
25 compliance" and there's a footnote 558

44 (Pages 488 - 491)



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<p style="text-align: right;">Page 492</p> <p>1 that points to a CFR PEMS calibration</p> <p>2 and verifications.</p> <p>3 BY MR. WOJTANOWICZ:</p> <p>4 Q. Okay. So that was in the context</p> <p>5 of the heavy-duty truck PEMS testing that's</p> <p>6 part of the regulatory structure in the United</p> <p>7 States, correct?</p> <p>8 A. Correct. That's the only -- the</p> <p>9 PEMS testing that's regulated in the U.S.</p> <p>10 Again, as I stated before, there's no PEMS</p> <p>11 testing for light-duty vehicles.</p>	<p style="text-align: right;">Page 494</p> <p>[REDACTED]</p> <p>4 BY MR. WOJTANOWICZ:</p> <p>5 Q. Now, you indicated that there's</p> <p>6 variability and you discussed that a few times.</p> <p>7 In your experience, is the only variability</p> <p>8 demonstrated by a PEMS equipment compared to</p> <p>9 dynamometer results in the upward direction?</p> <p>10 In other words, is it your opinion that the</p> <p>11 only difference you're likely to get between a</p> <p>12 PEMS result and a dynamometer result is that</p> <p>13 it's going to be worse?</p> <p>14 MS. SMITH: Objection, form.</p> <p>15 THE WITNESS: No, go for it.</p> <p>16 MS. SMITH: Go ahead, sir.</p> <p>17 THE WITNESS: No, it's</p> <p>18 possible that it could be lower. If</p> <p>19 you look at the information for the</p> <p>20 European Commission and EPA, their</p> <p>21 conformity factors or their adjustment</p> <p>22 factors are always in the upward</p> <p>23 direction showing there's more</p> <p>24 variability with the -- a combination</p> <p>25 of the PEMS equipment and the on-road</p> <p style="text-align: right;">Page 495</p> <p>1 testing. So the way the regulators</p> <p>2 have looked at it is always in the</p> <p>3 upward direction, but under certain</p> <p>4 directions, it's possible that it could</p> <p>5 show better emissions, but that's not</p> <p>6 something that the regulators have</p> <p>7 considered.</p> <p>8 BY MR. WOJTANOWICZ:</p> <p>9 Q. Are you aware that the RDE,</p> <p>10 European RDE standards requires for PEMS</p> <p>11 testing one continuous trip consisting of</p> <p>12 urban, rural, and motorway segments?</p> <p>13 MS. SMITH: Objection, form.</p> <p>14 THE WITNESS: My</p> <p>15 understanding is that --</p> <p>16 MS. SMITH: Sorry, go ahead.</p> <p>17 THE WITNESS: That's my</p> <p>18 understanding.</p> <p>19 BY MR. WOJTANOWICZ:</p> <p>20 Q. Okay. And is it your understanding</p> <p>21 that those segments are determined -- whether</p> <p>22 you're in a particular segment is determined by</p> <p>23 the speed of the vehicle at any given time?</p> <p>24 A. I can't remember the specifics of</p> <p>25 that. I can't remember the segmentation, so.</p>
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45 (Pages 492 - 495)

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1 BY MR. WOJTANOWICZ:

2 Q. And would you agree that when a car  
3 is being driven less aggressively, that's  
4 likely to have a downward impact on the NOx  
5 emissions going out at any given time?

6 A. It could influence emissions.  
7 Typically, it would be less, but again, it  
8 depends on the specific test conditions and  
9 engine and after-treatment operation, but  
10 typically, it would be lower.

11 Q. Okay. Are you aware that the RDE  
12 requires urban driving, the urban driving  
13 segment of a test to comprise 29 to 44 percent  
14 of the total, the rural part of the drive is  
15 supposed to be 23 to 43 percent, and motorway  
16 is supposed to be 23 to 43 percent of the total  
17 miles of the test route?

18 MS. SMITH: Objection, form,  
19 compound.

20 THE WITNESS: I don't have  
21 those foots memorized. Is there a  
22 document you're referencing?

23 BY MR. WOJTANOWICZ:

24 Q. No, you cite and rely upon the RDE  
25 and I'm assuming that you have some familiarity

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1 and expertise in it. If you don't recall right  
2 now, I will just represent to you that those  
3 are the standards. Do you have any reason to  
4 disagree?

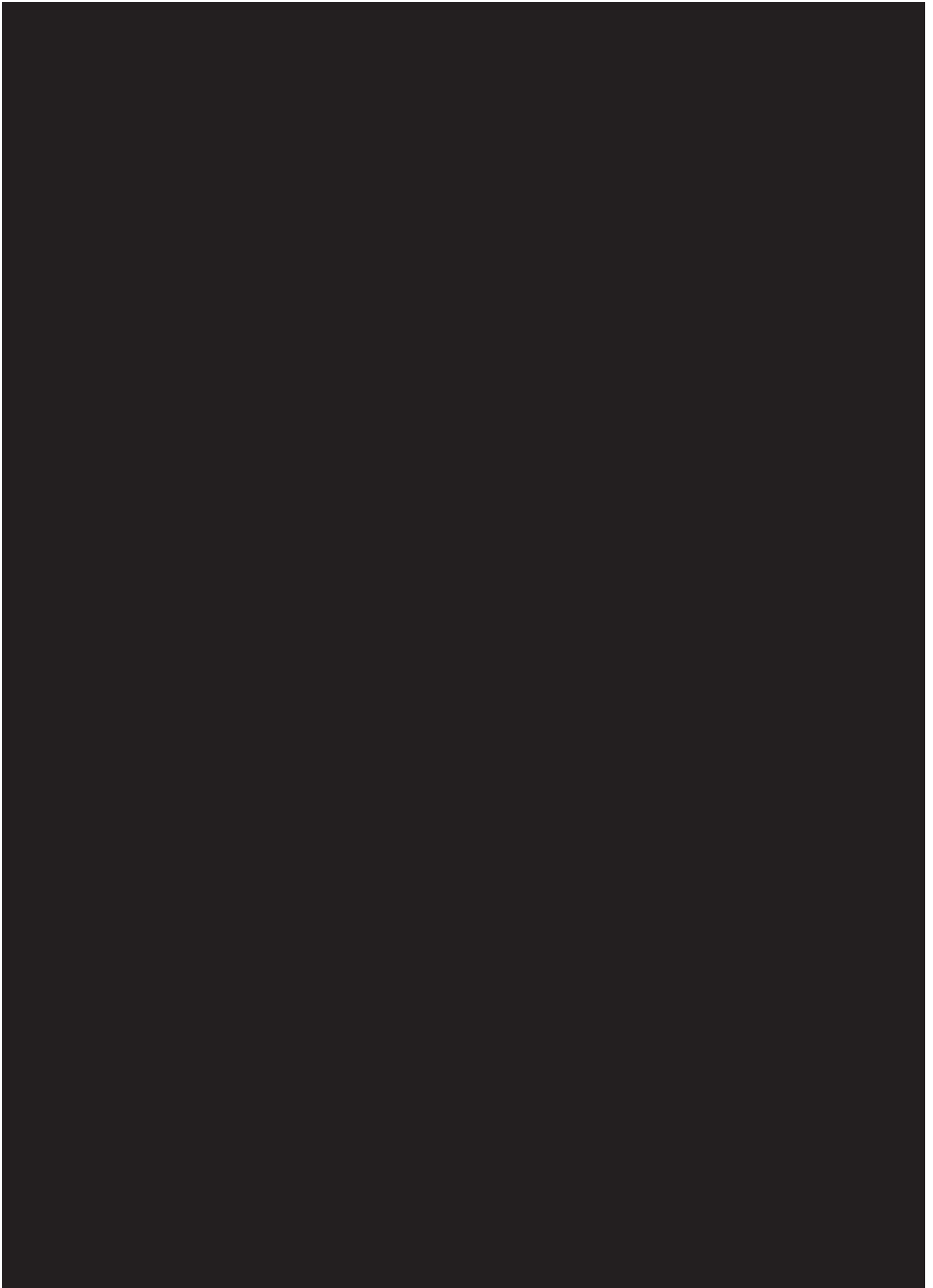
5 MS. SMITH: Objection, form.

6 THE WITNESS: Obviously, I  
7 haven't seen them, but I will for  
8 purposes of this go with your  
9 representation.

10 BY MR. WOJTANOWICZ:



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47 (Pages 500 - 503)

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<p style="text-align: right;">Page 504</p> <p>[REDACTED]</p> <p>5 MR. WOJTANOWICZ: Okay.</p> <p>6 Well, we can take a lunch break now.</p> <p>7 Should we go 40 minutes; is that okay?</p> <p>8 MS. SMITH: You know, can we</p> <p>9 go 45, sorry?</p> <p>10 MR. WOJTANOWICZ: Sure.</p> <p>11 MS. SMITH: So that takes us</p> <p>12 to three Eastern, I think; is that</p> <p>13 right?</p> <p>14 MR. WOJTANOWICZ: Yeah, that</p> <p>15 would be noon Pacific, three Eastern.</p> <p>16 THE VIDEOGRAPHER: It's</p> <p>17 2:14. We are off the record.</p> <p>18 ----</p> <p>19 (A recess was taken at this time.)</p> <p>20 -----</p> <p>21 THE VIDEOGRAPHER: The time</p> <p>22 is 3:02. We're on the record.</p> <p>23 BY MR. WOJTANOWICZ:</p> <p>24 Q. Okay. Mr. Harrington, I would like</p> <p>25 to go back briefly to your report, page 23,</p>	<p style="text-align: right;">Page 506</p> <p>[REDACTED]</p> <p>19 Q. But you have no basis for knowing</p> <p>20 why the EPA may not have taken any enforcement</p> <p>21 action, do you?</p> <p>22 MS. SMITH: Objection, form.</p> <p>23 THE WITNESS: I don't have</p> <p>24 any information on the decision-making</p> <p>25 on their end of it and I didn't see any</p>
<p style="text-align: right;">Page 505</p> <p>1 Exhibit 1.</p> <p>2 A. Okay</p> <p>[REDACTED]</p>	<p style="text-align: right;">Page 507</p> <p>1 action.</p> <p>2 BY MR. WOJTANOWICZ:</p> <p>3 Q. So you don't know if EPA decided</p> <p>4 not to take an enforcement, because, for</p> <p>5 example, they lacked the manpower to do so, you</p> <p>6 have no idea?</p> <p>7 MS. SMITH: Objection, form.</p> <p>8 THE WITNESS: I can't</p> <p>9 speculate on what they did.</p> <p>10 BY MR. WOJTANOWICZ:</p> <p>[REDACTED]</p>

48 (Pages 504 - 507)



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49 (Pages 508 - 511)

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50 (Pages 512 - 515)



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1 that could have significant impacts on  
 2 emissions?  
 3 A. I guess it depends on how you run  
 4 your test and how you set it up.  
 5 Q. Okay.  
 6 A. I guess, for example, you could  
 7 test in very, very cold and very hot  
 8 temperatures that are not consistent with how  
 9 typical driving is done. You could  
 10 overemphasize cold and hot testing.  
 11 Q. Now, if you're trying to determine  
 12 how a vehicle performs specifically in the  
 13 realm of specifically when outside temperatures  
 14 were hot, for example, wouldn't it make sense  
 15 to actually run more tests in those conditions  
 16 in order to try and get a complete picture of  
 17 how the vehicle behaved under those conditions?  
 18 A. Like I said, it depends on the  
 19 intent. If you're trying to understand how  
 20 something operates at a particular temperature,  
 21 there could be some value in that. So I guess  
 22 it depends how you then caveat your results.  
 23 I would also highlight that if  
 24 you're going to understand the impact of  
 25 temperature, not documenting how the air

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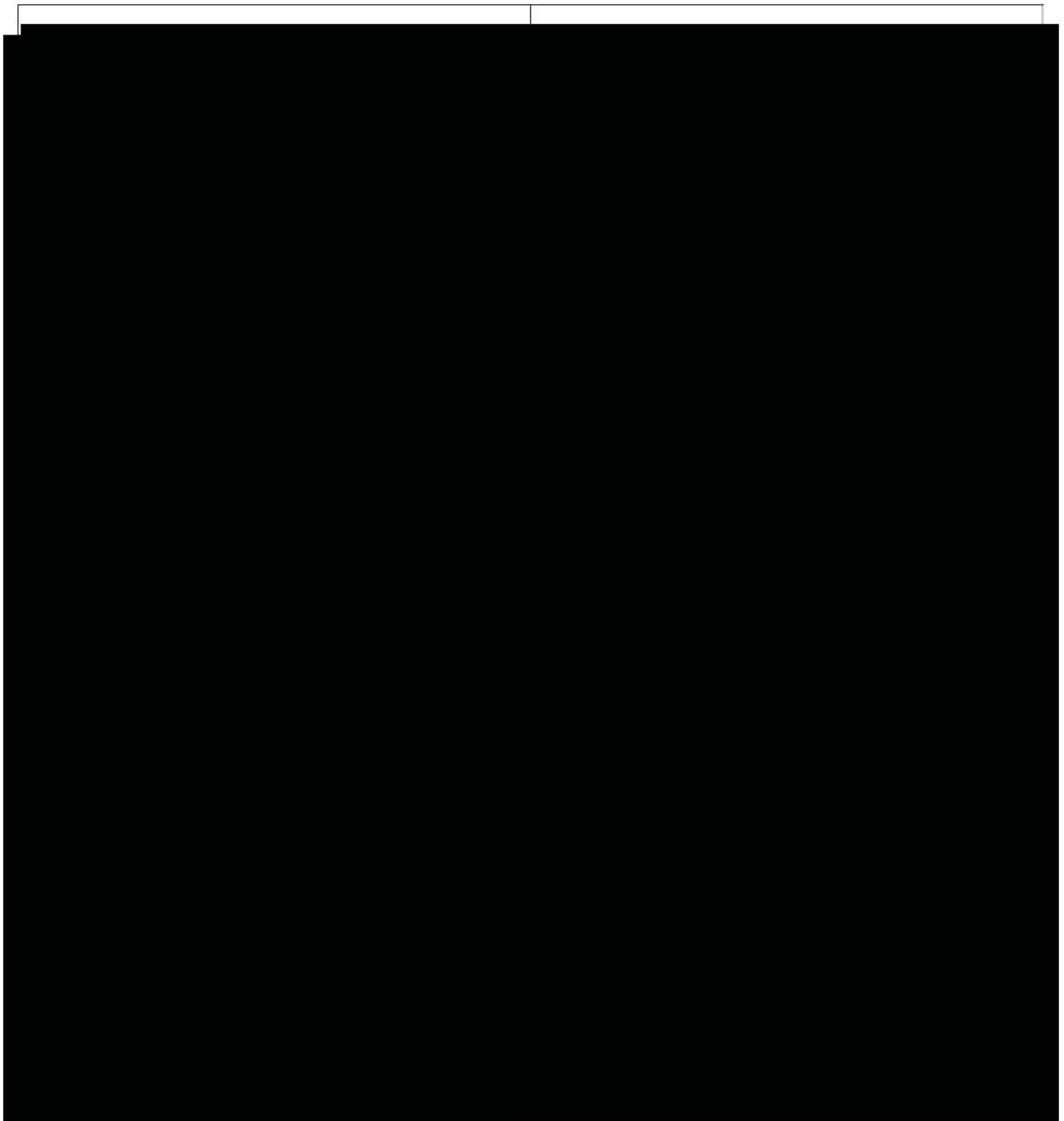
1 conditioner was used and having no record of  
 2 that and no information that you've told to  
 3 your drivers, that's a variable that can have  
 4 an impact on emissions if it is uncontrolled.  
 5 So in all of the testing that Mr. Smithers has  
 6 done, I saw no evidence and he stated he  
 7 didn't, he thought that it was with the A/C on,  
 8 but he wasn't sure, so it's, you know, he may  
 9 have been trying to understand how the impact  
 10 of high temperatures, but he had a variable  
 11 that was uncontrolled and not defined.  
 12 Q. Do you have an understanding that  
 13 drivers in the real world driving vehicles  
 14 around when it's warm outside, they tend to  
 15 turn on their air conditioner, don't they?  
 16 A. I can't speak to what people  
 17 typically do or what everybody would do, but  
 18 some people might roll the window down, some  
 19 people might use the air conditioner, which is  
 20 why the EPA has a specific test for high  
 21 temperature and air conditioning use, the SCO3.  
 22 Q. Are you aware of any circumstances  
 23 in which GM has informed people buying the  
 24 Cruze vehicles that they shouldn't use their  
 25 air conditioners?

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1 A. Just in any setting?  
 2 Q. Yeah, does GM tell people who  
 3 bought these Cruze vehicles that they shouldn't  
 4 use their air conditioners to avoid polluting  
 5 the environment?  
 6 A. I've not seen any documentation by  
 7 GM instructing drivers what to do with their  
 8 air conditioning.

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14 Q. When you're conducting engineering  
15 analyses for purposes other than litigation, do  
16 you simply rely upon whatever data happens to  
17 be presented to you or do you try to determine  
18 what data you need in order to provide a  
19 professional and thorough engineering analysis?

20 MS. SMITH: Objection, form.

21 THE WITNESS: Could you  
22 state the question again?

23 BY MR. WOJTANOWICZ:

24 Q. When you are performing engineering  
25 analyses for purposes other than litigation, do

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<p style="text-align: right;">Page 536</p> <p>1 again, it's hard to make those comparisons.  2 And you'd have to look really look through it.  3 But at the end of the day, there's still issues  4 with the vehicle, you know, issues that were  5 observed that could have influenced it, so it  6 calls into question the reliability of that  7 testing.  8 Q. And, again, those supposed issues  9 with the vehicle you identified were at the  10 vehicle inspection, which occurred a  11 significant amount of time after the actual  12 PEMS tests were conducted, correct?  13 A. So my understanding is that, you  14 know, the recall was still active starting in  15 2016. There was a dyno test that was done in  16 between or in the middle of the testing that  17 showed results above the certification under  18 the standard, the 70 milligrams per mile, so  19 something was not normal with the vehicle at  20 that point or there was something that was  21 worth considering that was well prior to the  22 inspection.  23 Q. You referred to a recall and you  24 refer to software updating in your report, but  25 you say that they should have updated the</p>	<p style="text-align: right;">Page 538</p> <p>1 light had something to do with the emissions  2 system, but I don't know if there would have  3 been any impact, however, having an active  4 recall and an emissions system component,  5 you're trying to replicate vehicles that are  6 on-road that are getting that recall, it seems  7 like it would be good engineering practice to  8 update the vehicle to have it under the same  9 conditions that the vehicles were in after the  10 recall and on-road.  11 Q. And there's also a software update  12 that was issued during the time that the  13 vehicle was being tested, correct?  14 A. That's my understanding, yes.  15 Q. And, again, had Mr. Smithers  16 installed that software update, wouldn't there  17 have been an issue with tests run before the  18 update and after the update no longer being  19 comparable or having the tests before not being  20 replicable?  21 MS. SMITH: Objection, form.  22 THE WITNESS: You know, I  23 don't know what the impact would be.  24 There could be a difference, but not  25 understanding that difference, you</p>
<p style="text-align: right;">Page 537</p> <p>1 software, correct?  2 A. There was an open recall on the  3 upstream NOx sensor, that's correct.  4 Q. Okay. Now, if some of the testing  5 had been done prior to the recall, then if they  6 had actually performed the recall, then the  7 testing that they had done prior to the recall  8 would not be replicable, would it?  9 A. It may not have been replicable.  10 One thing that Mr. Smithers could have done was  11 retest under similar conditions, we would have  12 done a dyno testing at the very beginning which  13 would have been good. He could have checked  14 that against new testing or he could have rerun  15 some of his routes under similar conditions to  16 see if there was any difference, but I didn't  17 see any evidence that he did anything to  18 understand or try to even understand the  19 difference if he would have applied it. He  20 just did not apply the recall.  21 Q. Okay. So what did you do to  22 understand what the difference would have been  23 if you had applied the recall?  24 A. I didn't do anything. My  25 understanding that the recall mentioned a MIL</p>	<p style="text-align: right;">Page 539</p> <p>1 know, leaves some question about his  2 vehicles' representativeness to the  3 other vehicles on the road that have  4 that recall.  5 BY MR. WOJTANOWICZ:  6 Q. Okay. But you didn't do anything  7 to analyze what emissions impact installing or  8 not installing that recall had, did you?  9 A. No, I did not.  10 Q. And General Motors, who presumably,  11 you know, on whose behalf you're offering  12 testimony in this case, and who presumably  13 knows the impacts of all of the software and  14 hardware changes it makes to the emissions on  15 its vehicles, they didn't provide you with any  16 information to tell you exactly what the  17 emissions impact would be for installing that  18 software update, did they?  19 MS. SMITH: Objection, form.  20 THE WITNESS: I haven't seen  21 any information on the impact on those  22 vehicles, no.  23 BY MR. WOJTANOWICZ:  24 Q. And General Motors, whose counsel  25 provided you all of the information that you</p>

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1 relied on for purposes of your opinion, didn't  
2 provide you with any information specifying the  
3 emissions impact of performing the recall on  
4 the sensor that you mentioned earlier? They  
5 didn't do that either, did they?

6 A. I'm sorry, I lost track of the  
7 question.

8 Q. You were recalling or discussing a  
9 recall earlier that was not performed on the  
10 vehicle. General Motors nor did its counsel  
11 provide you with any information outlining the  
12 specific emissions impacts of performing that  
13 recall, did they?

14 A. I have not seen any information on  
15 the impact of that recall.

16 Q. I would now like to mark --  
17 or actually, we'll go back to tab number 16,  
18 Exhibit 15.

19 THE TECHNICIAN: By the way,  
20 Garth, you've been given the ability to  
21 introduce your own exhibits now. I  
22 troubleshoot over lunch.

23 MR. WOJTANOWICZ: Okay.  
24 Great, thank you.

25 THE TECHNICIAN: So if you

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1 try the next time, we'll go from there.

2 Thank you.

3 -----



4 BY MR. WOJTANOWICZ:



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<p style="text-align: right;">Page 552</p>  <p>9 for Mr. Smithers' testing, don't you?</p> <p>10 MS. SMITH: Objection, form.</p> <p>11 THE WITNESS: Some of that</p> <p>12 data. Again, there's some missing data</p> <p>13 about air conditioner use and other</p> <p>14 aspects, but some of that information</p> <p>15 about temperature and things like that</p> <p>16 are present.</p> <p>17 BY MR. WOJTANOWICZ:</p> <p>18 Q. Okay. So you could repeat the test</p> <p>19 routes, because there was GPA [sic] data for</p> <p>20 Mr. Smithers' tests, correct?</p> <p>21 MS. SMITH: Objection, form.</p> <p>22 THE WITNESS: There's GPA</p> <p>23 data?</p> <p>24 BY MR. WOJTANOWICZ:</p> <p>25 Q. You have GPA information in the</p>	<p style="text-align: right;">Page 554</p> <p>1 potential issues with the temperature probe</p> <p>2 measurement that I mentioned that there was</p> <p>3 some anomalies, so there would be some</p> <p>4 uncertainty there and uncertainty about the</p> <p>5 weight or exactly how the driver was driving,</p> <p>6 but there would be some information from the</p> <p>7 GPS vehicle speed and other things to allow</p> <p>8 some form of repeatability, but there's,</p> <p>9 obviously, vehicle condition and other things</p> <p>10 would make it difficult to replicate completely</p> <p>11 Mr. Smithers' data or Mr. Smithers' testing.</p>
<p style="text-align: right;">Page 553</p> <p>1 test results provided by Mr. Smithers that</p> <p>2 would allow you to replicate every single test</p> <p>3 run that he did, don't you?</p> <p>4 MS. SMITH: Objection.</p> <p>5 THE WITNESS: I don't know</p> <p>6 what GPA data is.</p> <p>7 BY MR. WOJTANOWICZ:</p> <p>8 Q. I'm sorry, you're right. GPS, I'm</p> <p>9 mixing the letters here, it's another, you</p> <p>10 know. Sorry, GPS data that would allow you to</p> <p>11 replicate the routes that Mr. Smithers</p> <p>12 provided?</p> <p>13 A. There are certain aspects that we</p> <p>14 could replicate. There's, obviously, not all</p> <p>15 information was there and it's hard to do</p> <p>16 complete repeatability testing with PEMS,</p> <p>17 because there's some variability, but there was</p> <p>18 GPS information and that --</p> <p>19 Q. Pardon me. You also have, you have</p> <p>20 information that allows you to know what the</p> <p>21 temperature was, what the speed of the vehicle</p> <p>22 was, and you've got the GPS data also allows</p> <p>23 you to assess the elevation of the vehicle at</p> <p>24 any given time, correct?</p> <p>25 A. You know, again, there was</p>	 <p>7 Q. Mr. Smithers did provide</p> <p>8 maintenance records and inspection records for</p> <p>9 when the vehicle was purchased and as I said,</p> <p>10 the DTC information is included in the testing</p> <p>11 data, isn't that relevant to the state of</p> <p>12 health of the vehicle?</p> <p>13 MS. SMITH: Objection, form.</p> <p>14 And foundation.</p> <p>15 THE WITNESS: Again, the</p> <p>16 DTCs, that data was not listed. It was</p> <p>17 listed for the gasoline vehicles, but</p> <p>18 interestingly enough, it wasn't listed</p> <p>19 for the diesel vehicle. It's not clear</p> <p>20 why it was recorded for one vehicle but</p> <p>21 not the other. And there were some</p> <p>22 maintenance records, but as has been</p> <p>23 evidenced throughout this, there was</p> <p>24 not all the records. There was -- his</p> <p>25 report didn't mention the NOx sensor</p>



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